Title

GROUPINGS OF ORGANIC WASTE CHEMICALS BASED ON SORPTION, BIOTRANSFORMATION AND HYDROLYSIS AT STANDARD CONDITIONS FOR APPLICADION TO THE DEEP SUBSURFACE ENVIRONMENT

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Groupings of Organic Waste Chemicals Based on Sorption, Biotransformation and Hydrolysis at Standard Conditions for Application to the Deep Subsurface Environment

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ABSTRACT

Chemical and biological reactions of organic hazardous wastes disposed to injection wells at depths down to 7000 feet deep are assessed. At these depths, the major reactions involving organic wastes include hydrolysis, biotransformation and sorption. However, experimental data on reactions of organics in the deep subsurface are sparse or nonexistent.

Tables are given on values for hydrolysis, sorption and biotransformation reactions obtained from research publications, mostly at 25 ° C and atmospheric pressure. It is suggested that the more plentiful data on reactions at the land surface be used to approximate the rates of hydrolysis and biotransformation, and sorption equilibrium by taking into account the expected subsurface environment. For example, predictive methods will take into consideration a deep subsurface environment which has: a higher temperature and pressure than the land surface; fewer kinds of microorganisms and a substantially lower concentration of microorganisms; lower organic carbon levels; and, highly saline ground waters.

1.0 INTRODUCTION

Injection wells are used to isolate organic liquid wastes resulting from industrial processes by pumping the liquids into carefully selected subsurface geologic formations (1-3,57). This is an attractive method for disposal of hazardous liquid organic wastes because the injected material is efficiently removed from man's immediate air, water and land environment. Other beneficial aspects sought are the isolation of these organic wastes for geologic times (56), and eventual transformation into stable products which might include inorganic substances, carbon dioxide and water (4). The method is economical when compared with other optional procedures, especially those where pretreatment is required (2). Most injection wells were drilled in the mid-1960's and mid-1970's; there has been no significant increase since 1980 (57, p.6). Injection of hazardous wastes is not a widespread practice (57, p.11). However, the question has been raised, can these wastes enter our source of underground drinking water by migration from the disposal well sites. Implicit in this question is the time required for the waste constituents to travel by groundwater movement or by diffusion, because it is likely that the original organic substances will undergo reactions outside the immediate disposal well system.

Understanding the reactions (fate) of organic chemicals disposed to the deep subsurface environment at depths of 1000 to 7000 feet is important to their management and regulation (13). These reactions are best understood by experimental measurements of chemical reactions most likely to occur in a heterogeneous system consisting of minerals, organic matter and ground water. However, little information is available for all hazardous organic substances and their reactions below about 10 meters, so that predictive methods are mandatory. Predictive methods ideally would use the plentiful data compiled from laboratory measurements or calculations for 25 °C and for pressures near one bar. These values of equilibrium constants and kinetic rate constants can then be extrapolated to conditions which reflect a deep subsurface environment using theoretically based methods and correlations, to account for the effects of differing temperatures and pressures.

The data in this compilation were selected for use in a model for reactions between a generic waste injection site comprised of an immobile mineral/organic carbon solid

phase; an aqueous liquid phase; and, simple organic wastes which have been injected into this subsurface environment. The reactions and associated data considered are limited to sorption of the waste constituents onto the organic carbon (humus) portion of a mineral/soil solid phase (13-25); biotransformation by microorganisms, principally bacterial (4-13,24-32); solubility (35,36,38); Henry's constants (39-41); and, hydrolysis (34,35,37). In an undisturbed subsurface environment, the number of microorganisms is expected to be substantially less than that at the surface and in surficial soils (5,30,31). Injection of the wastes could cause an increase in both the population of microorganisms and the organic content of the soil. However, the established soil microflora are likely to resist introduction of new microorganisms (43,p.22). There is less organic material bound to the minerals (43,46), so that adsorption onto mineral surfaces becomes important (25,p.319) when considering retardation mechanisms. Lastly, at these depths both the ambient temperature (45) and pressure will differ from that prevailing at the surface; both are higher, and have a major effect on homogeneous and heterogeneous reactions involving injected organic material. The model for the injection process is depicted in Figure 1.

Nonchemical removal of the various waste constituents from a containment site by diffusion, or migration by movement of groundwater are excluded from this report. Sequential reactions of an organic waste such as biodegradation of a product formed from hydrolysis are not considered; only the initial reactions are covered. Calculations on the fate of organic wastes in the deep subsurface is outside the scope of this report.

Additional information on reactions of organic materials in the soil/water environment near the land surface can be obtained from References 5 and 15.

1.1 Organic Wastes Constituents

The individual organic constituents in this grouping were obtained from the Proposed Grouping of Listed U and P Waste Codes (49). The result is a tabulation for about 300 organic chemicals representing both liquid and solid forms of the pure chemicals. Some

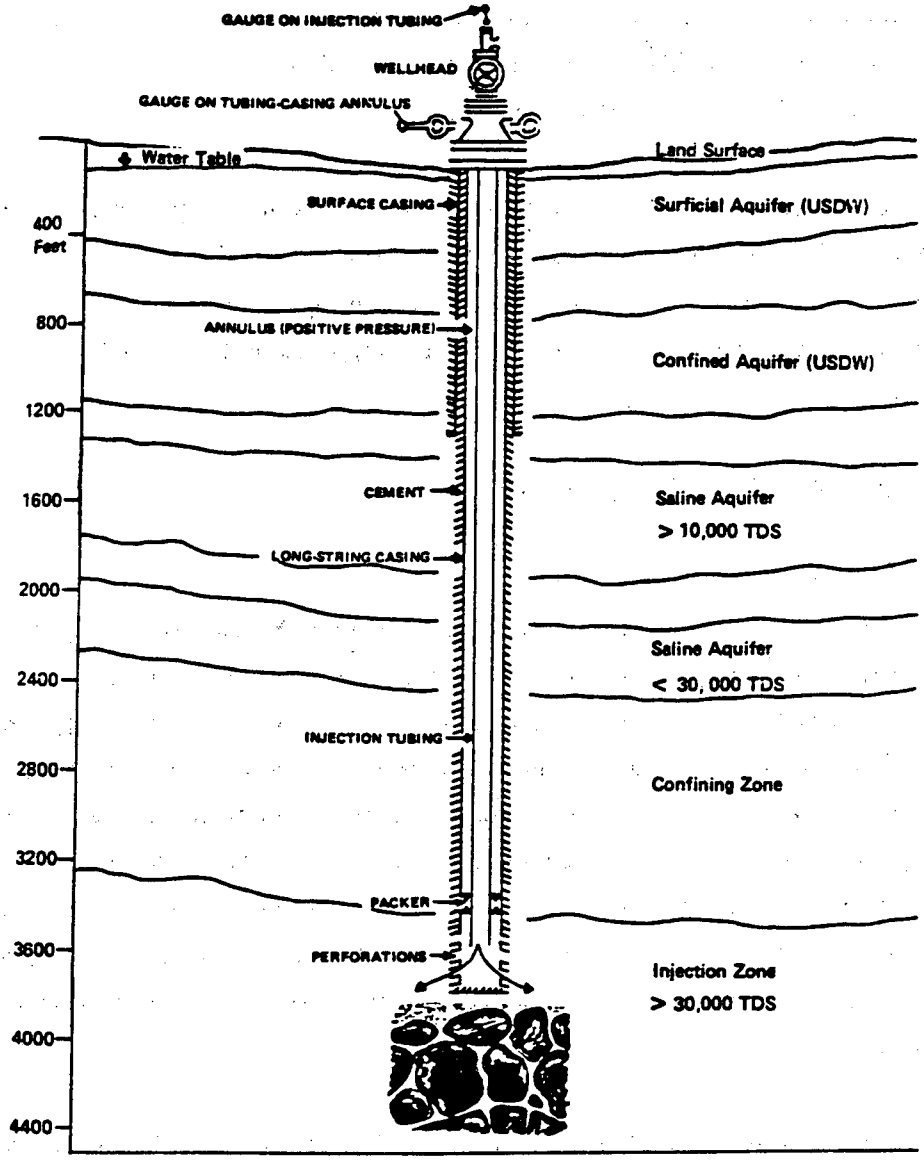

Figure 1. A model of the injection environment (57). At land surface: organic carbon (OC) is 0.06 to 2% w (assumed bound to minerals, see Refs. 15 and 20); microorganisms (Ref. 43) are 10^6 to 10^7 bacteria per gram of soil (Ref. 5), other microorganisms such as 1,000,000 to 20,000,000 actinomycetes; 5000 to 900,000 fungi; 1,000 to 100,000 yeasts; 1,000 to 500,000 algae; 1,000 to 500,000 protozoa. Temperature is variable. In the deep subsurface environment, such as 4,000 to 7,000 feet; it can be assumed: organic carbon $<0.06\%$; microorganisms (principally bacterial) $<< 10^6$ cells per gram; temperatures exceed about 35 °C. However, aerobic bacteria have been found beneath the subsurface at the Savannah River Laboratory (58).

of these chemicals are identified as constituents in hazardous wastes from both specific and non-specific sources. These sources have an industry and EPA hazardous waste number (49) which is included in this tabulation.

Table 1-1 lists selected organic wastes that have been injected into deep geologic formations (2,3,13). These wastes from industrial operations were classified by Donaldson into 15 categories of water-soluble oils, and two classes of water-insoluble oils (2). More recent information is found in the comprehensive report of Reference 57.

1.2 Deep Subsurface Soil/Water Environment

A description of selected injection wells was tabulated by Donaldson up to about the year 1971 (2). The listing covered geologic formations at depths ranging from 1500 feet to 7200 feet (300 to 2400 meters). These formations were mostly comprised of three types of materials: unconsolidated sands, sandstone and a vugular carbonate (limestone and dolomite). The disposal sites were selected because they were porous, permeable, and had a large areal extent. Types of formations and their geological properties are given in Tables 1-2 and 1-3. It should be noted that injection of the wastes displaces the natural pore waters from these wells (2, p.34). The properties of the formation soils are important in containing the organic wastes, for example sorption capacity for individual organic wastes.

Unconsolidated sands in the Frio formation of Harris County, Texas are medium to fine-grained, loosely cemented and calcareous (50). The components of the sands varied with depth; however, quartz and smectite (montmorillonite) clays and feldspars were usually present between 5709 - 6290 feet depths. The clay content measured as the methylene blue capacity varied from 2 to 48 me/100 g (50).

Most sandstones are comprised of a small number of minerals; an average sandstone has 66.8% SiO_2 (primarily quartz); 11.5% feldspar; 11.1% carbonate minerals; 6.6% micas and clays; 1.8% iron oxides; and, 2% other minerals (13,p.16). Limestone is mostly $CaCO_3$ (calcite), but can contain a significant amount of noncarbonate constituents such as clay minerals (13,p.15).

Clay minerals are important because they represent a highly reactive and large surface area (13,25,55): about 500 m^2/g for montmorillonite (55). This reactivity is manifested by a large capacity for adsorbing many polar organic substances (51,p.288). For example, recently Charlesworth (23) studied the interaction of clay minerals with organic nitrogen compounds and found up to 70% adsorption on the basis of total nitrogen, by nine common clays under laboratory conditions. See Table 1-4. Clays also catalyze redox and other reactions such as cracking of hydrocarbons (55).

Experimental studies uniformly show a direct correlation between the fractional organic content of a specific soil or sediment, and the soil/water partition coefficient. These studies are limited to surface samples which were obtained within about 9 meters (30 feet) beneath the surface. Organic matter due to decaying plant and animal life (humus) concentrates in this surface layer: "the concentration decreases abruptly with depth so that the deep subsurface is almost wholly mineral matter in most soils" (43,p.4). Adsorption of organic wastes and bacteria onto mineral surfaces may be more important in the deep subsurface than in shallow soil because of the dearth of organic matter. However, this accumulation at the mineral/water interface might be more reversible than adsorption at an organic carbon/water interface (52,p.2). The result will be an excess of immobile organic wastes at the mineral/water interface due to weak van der Waals or electrostatic adsorption (53). Also, any gases evolved will accumulate at this interface; the gas/water distribution is assumed to follow Henry's law. The water/soil interface represents a source of nutrients for bacteria (52,p.2).

Because oxygen is absent (30,31,54), bacterial action is anaerobic (e.g.,methanogenic). Bacteria have been found in water samples obtained from wells, and in lithologic cores; their presence in groundwater is well documented (54,p.299). See Table 1-5. Microorganisms are not evenly distributed in soils; for example, in a sandy soil "the majority of bacteria are associated with a minor fraction of the soil- organic matter...." (25,p.319).

2.0 GROUPINGS OF WASTES

Organic industrial wastes injected into the deep subsurface environment up to about the year 1970 are complicated mixtures of pure organic chemicals and inorganic salts in

water (2,13). The pH varied from 2 to highly alkaline (8% NaOH); the content of inorganic salt such as NaCl varied, as did the total amount of organic waste material. See Table 1-1. It is recognized that reactions which determine the fate of the organic content should be viewed from the perspective of one substance reacting competitively with other constituents in the waste. For example, sorption might involve adsorption and desorption of one or more organic compounds at the solid/water interface; hydrolysis rates can be affected by ionic strength and catalytic metal ions. However, in this report we have decided to focus on individual organic substances in tabulating data on reactions which determine the fate in the deep subsurface.

Organic chemicals can be organized into a number of different categories; most often this is done by functional group. In this report, we have chosen to follow the organization given in Attachment 2 of the Proposed Grouping of Listed U and P Waste Codes (47). This selection was made to ensure compatibility with that of the EPA document, and the Part 261 of the Code of Federal Regulations (49). These identify the substances as acute (P) and toxic (U) hazardous wastes (49). See the printout of the tables of data in the Appendix.

For each pure organic substance in the Appendix, the Grouping category is given, followed by the name of the organic and the date identifying when the data were tabulated. Other commonly used names for the organics are given, together with the Chemical Abstracts Services (CAS) number. For purposes of identification, we also include the Hazardous Waste Number, and an Industry/EPA Generic No. The Industry/EPA Generic No. is not, however, related to the source of the waste injected into the subsurface disposal system. The empirical chemical formula is also given. Under the heading "Description", there is a listing of selected physical properties of the pure substance, and a reference to source of the data. The physical properties are intended to provide information on the organic chemical to be used in predicting its form in the deep subsurface, e.g., gaseous, soluble in water, or solid. The general heading Retention properties is defined as the chemical and biochemical reactions which determine the fate of the organic within the injection zone. These values are all at 25 ° C and about 1 bar pressure.

The data in the tabulation of the Appendix are the database for laboratory conditions which are to be used in predicting the fate of organic wastes disposed to the deep subsurface by injection wells.

3.0 METHODOLOGY FOR ASSESSMENT OF FATE

The fate of an organic substance injected into the deep subsoil depends mainly on the transformation of the original material into an initial product. An example is chemical transformation by hydrolysis of a bromoalkane to form an alcohol (34). This alcohol product may then undergo further chemical or physicochemical reactions; however, these subsequent reactions are not considered in this report. Where possible, each of the reactions treated here (biotransformation, hydrolysis) is given a half-life ($t_{1/2}$) so that a numerical value can be calculated and assigned to the "fate" process. An exception is sorption which is considered to be kinetically fast, and therefore as an equilibrium process. In the absence of experimental data obtained at depth, correlations using these surface soil data are suggested for filling gaps.

3.1 Equilibrium Sorption Correlation

Sorption of organic substances onto an organic matrix such as humus materials is an important retardation process in the topsoil. The sorption is kinetically slow (17,18), but virtually irreversible (17). In topsoil, the result of this adsorption includes removal of the organic substance from the aqueous phase with a probable resulting change in reactivity of the sorbed species, e.g., biotransformation rate may change (16).

Sorption of organic substances onto organic carbon (e.g.,humus) bound to minerals has been studied extensively (14-23). Selected data obtained from soils and sediments are shown in Table 3-1. Karickhoff developed a semi-empirical estimation of sorption of hydrophobic organic substances onto soils from aqueous media (14). A key relation is the adsorption onto the organic carbon (OC) fraction of natural soils or sediments. The relationship between the concentration of sorbed material and the concentration of pollutant in the water phase for dilute solutions at equilibrium is given by eq 1.

$$\Gamma = K_p C \qquad (1)$$

Γ = concentration of organic waste sorbed onto OC

C = solution concentration of the sorbent

K_p = sorption partition coefficient for the heterogeneous process

A definition of a dilute solution is an aqueous phase concentration less than 10^{-5} M in pollutant concentration, or below one-half its solubility (14). The dependence of sorption on the OC content of the soil is given by eq 2

$$K_p = K_{OC}\, OC \tag{2}$$

where OC is the weight fraction of organic carbon in a sediment or soil (16); K_{OC} is a fugacity coefficient ratio (16). Table 3-2 lists selected values of OC for differing sediments (15) and soils (20).

Such studies have shown a linear correlation between sorption of hydrophobic organic chemicals and the octanol/water partition coefficients (15,21).

3.1.1 Octanol/Water Partition Coefficient

Values of octanol/water partition coefficient are obtained from laboratory measurements using purified and carefully characterized chemicals. The relationship between these laboratory data and partitioning of an organic waste between soil and water is a linear correlation between the $\log K_{oc}$ and $\log K_{ow}$. For a water and sediment system, Karickhoff et al. found with a correlation coefficient, $r^2 = 1.00$ (15)

$$\log K_{oc} = (1.00)\log K_{ow} - 0.21 \tag{3}$$

Chiou et al. (21) developed a correlation applicable to the partition equilibrium of non-ionic organic compounds distributed between organic matter bound to soil and the water phase, eq 4 with $r^2 = 0.989$:

$$\log K_{om} = (0.904)\log K_{ow} - 0.779 \quad (4)$$

where, for eq 3 and eq 4

K_{oc} = a sorption coefficient on an organic carbon (oc) basis, equal to $\frac{K_p}{oc}$ (15)

K_{ow} = octanol/water partition coefficient, often determined by shaking known volume of octanol containing small amount of solute with water, then measuring solute concentration in octanol (C^O) and water (C^W); $K_{OW} = C^O/C^W$.

K_{om} = solute partition coefficient between soil organic phase and water. The soil organic phase is Woodburn silt loam soil: 1.9% organic matter, 68% silt, 21% clay, 9% sand, cation exchange capacity of 14 meq/100 g soil.

We have used eq 4 to calculate values of K_{om} for selected missing data in the printout in Section 7.0. In the absence of laboratory data on K_{ow}, the magnitude of K_{oc} can be estimated from the solubility, for example, for selected hydrophobic hazardous wastes (21), using eq 5. See Table 3-3.

$$\log K_{om} = -0.729\log S + 0.001 \quad (5)$$

where S = moles/L for supercooled liquids and $r^2 = 0.996$ (21).

However, Southworth and Keller (20) found that for soils with low OC, e.g., 0.05%, correlations such as eq 5 predict lower sorption for polar substances such as phenol, because of interactions between the organic pollutant and the mineral surfaces. This is probably because sorption onto a mineral surface is less likely to be totally irreversible than sorption onto an organic carbon surface such as humus bound to the mineral.

In summary, the partitioning of hydrophobic organic wastes between water and the organic content of a soil can be correlated to laboratory measurements of the octanol/water partition coefficient. The value of K_{om} is a measure of sorption of the organic waste; and, eq 4 has been used in this work to estimate some values of K_{om}. It is suggested that eq 4 be used to calculate the magnitude of K_{om} in the deep subsurface, after adding terms or otherwise modifying the equation to account for increased

temperature and pressure in the deep subsurface.

3.2 Biofilm Model Kinetics

Bouwer and McCarty (46) described a model for the biotransformation of trace organics in subsurface ground waters according to biofilm processes. An ideal biofilm is composed of a homogeneous matrix of bacteria and extracellular polymers that bind the bacteria together, and to the subsurface organic matter, which in turn is bound to the rock. The model can be interpreted for a subsurface environment generally characterized by low substrate and nutrient concentrations, and high specific surface area. Bacteria are likely to be attached to and therefore be immobile on the deep subsurface soils and minerals. The population of native bacteria is much smaller than in a surface soil. Webster et al. (1985) found 10^6 to 10^7 cells per gram of subsurface soil, at depths from 2 to 9 meters. The number of cells is undoubtedly far less in the deep subsurface, from 300 to 2500 m deep, in an injection environment.

Bouwer and McCarty (46) give eq 6 as an expression for the degradation half-life, $t_{1/2}$, of the substrate:

$$t_{1/2} = \frac{\ln 2}{[(kX)/K_s]} \tag{6}$$

where k = first order reaction maximum rate constant, sec^{-1}, of substrate utilization by bacteria and X = average concentration of organisms such as bacteria capable of degrading the organic contaminant; K_s = Monod half-maximum-rate concentration.

Table 3-4 lists half-lives based on microorganism concentrations, under both aerobic and methanogenic conditions. Note that degradation in the absence of oxygen is tenfold less than under aerobic conditions. Also, the rate of biotransformation decreases by tenfold, with a tenfold decrease in organism concentration. Therefore, half-lives of biotransformation processes may be increased due to the fewer number of organisms available in the deep subsurface.

In predicting the fate of organic wastes in the deep subsurface, the half-life of organic wastes in this environment might be estimated by assuming that: (a) $t_{1/2}$ can be divided by a factor of 10 for laboratory measured aerobic biotransformations; and, by 100 for anaerobic. (b) It might also be assumed that the microorganism concentration is 0.001 mg/L or less, so that laboratory data obtained at surface conditions could be divided by 10^5.

With regard to temperature effects on biotransformation reactions, Fuller and Warrick (43,p.25) note that "microbial decomposition of organic materials occurs most rapidly in the mesophilic (25 to 35 ° C) range, higher and lower temperatures favor some organisms,... Thus, biodegradation will occur over a wide range of temperature, although it takes place more slowly near the extremes of 0 ° C and 65 ° C...". In the absence of other information on the kinds of microorganisms down to 5000 feet it might be assumed, as a first approximation, that data at 25 ° C can be used to estimate biotransformation rates in the deep subsurface under anaerobic conditions.

3.3 Hydrolysis Half-Life in the Deep Subsurface

Hydrolysis is a chemical process in which an organic hazardous waste constituent reacts with water to form a different substance. The detailed mechanism may involve intermediate products; however, the rate of hydrolysis of a substance RX usually follows the kinetic equation (33)

$$\frac{-d\,[RX]}{dt} = k_h\,[RX] \tag{7}$$

$$\ln[RX] = -k_h\,t \tag{7A}$$

so that when one-half of substance RX has reacted in time $t_{1/2}$,

$$t_{1/2} = \frac{\ln 2}{k_h} \tag{7B}$$

for the simplified reaction $RX + H_2O = ROH + HX$, where X is a functional group such as Cl^-. In eq 7, k_h is a pseudo first order reaction rate constant. The reaction rate is a function of a number of parameters such as pH, temperature, ionic strength and concentration of metal ions which might catalyze the reaction. Examples of catalytic metals are ions of Cu, Co, Mn and Mg (33).

As noted, the rate of hydrolysis for organic wastes depends on a number of parameters, mainly pH, temperature, concentration of organic pollutant, functional group of the organic wastes, and pressure (33). Mabey and Mill (33) have summarized critically evaluated hydrolysis rates and half-lives at pH 7, 25 ° C, atmospheric pressure, and zero ionic strength. However, in the deep subsurface, the temperature is higher and therefore the hydrolysis rates should increase. The enhanced hydrolysis rates due to temperature of the deep subsurface e.g., 55 ° C, can be calculated from the equations given by Mabey and Mill (33), for example. Effects of increased pressure, catalytic effects and differences in hydrolysis rates due to ionic strength are difficult to predict; these may be negligible compared with the larger effects of increased temperature, as a first approximation.

Hydrolysis half-life is estimated according to the usual expression

$$t_{1/2} = \frac{0.693}{k_h} \tag{8}$$

In eq 8, k_h is related to pH by the following equation used by Mabey and Mill to calculate k_h

$$k_h = k_B [OH^-] + k_A [H^+] + k_N \tag{9}$$

where $K_W = [OH^-][H^+]$, and k_B, k_A, and k_N are second-order rate constants for acid and base catalyzed and neutral processes, respectively (33). The constant, K_W is the ion product of water. This is equal to -13.995 at 25 ° C and -13.275 at 50 ° C (56).When the pH is fixed, eq 8 describes the half-life of the hydrolysis reaction. Table 3-5 summarizes selected $t_{1/2}$ values for hazardous organic wastes taken from the larger tabulation in Mabey and Mill (33).

4.0 SUMMARY AND CONCLUSIONS

The principal homogeneous and heterogeneous chemical reactions controlling the fate of organic wastes in the near surface soil/water environment include sorption, biodegradation and chemical degradation such as hydrolysis (33). For example, Sutton and Barker (42) injected about 2100 liters of an aqueous mixture containing 70 to 100 ppm of dissolved n-butyric acid, phenol, o-chlorophenol and dimethyl phthalate into a soil. Injection depth was below the water table for this site, at 5.5 to 6.25 meters below the ground surface. For these organic substances, biotransformation appeared to be more important than sorption for a period of 204 days.

In summary, a model is proposed to depict the fate of organic waste substances disposed to a deep subsurface environment by injection wells. The model assumes that the principal reactions are sorption onto organic carbon, accumulation at the soil/water interface according to a Henry's law isotherm, biotransformation by native bacteria, and hydrolysis. A tabulation of values for use in predicting the retention of organic wastes is given in the Appendix. In the absence of experimental data, correlations based on laboratory measurements are suggested with appropriate modifications to reflect a soil/water environment down to 2500 m. Sorption of organic nonpolar compounds at 25 ° C is estimated from the relation for the equilibrium partitioning between soil organic matter and an aqueous phase by eq 4 (21), assuming that organic substances sorb independently of one another. In the absence of organic matter, accumulation of organic wastes at the mineral/water interface is reflected by Henry's constant. When laboratory measurements, or other data, are lacking the half-life of a trace organic can be estimated from Table 3-4 (46), for biotransformations. Bouwer and McCarty based their model, in part, on "large-scale subsurface contamination with low active organic concentrations and

slow ground-water movement...." (46). Under these conditions, biotransformation rates are expected to be slow by comparison with those at the surface. The effects of temperature in the deep subsurface environment on microbial action differ, depending on the kind of bacteria in this region (43,p.24). Hydrolysis half-lives from the evaluation by Mabey and Mill, are probably higher at, e.g., 55 ° C, a temperature based on a geothermal gradient of 20 ° C/km (45), and an average disposal depth of 5000 feet (1.5 km).

5.0 RECOMMENDATIONS FOR ADDITIONAL RESEARCH

After reviewing the current data on fate of organic wastes in the deep subsurface environment in consideration of the information required, some specific recommendations are appropriate. The optimum future laboratory measurements and predictive activities should include:

1. Development of a predictive model for the fate of organic wastes in the deep subsurface environment which takes into account the important reactions of specific organic substances. The computerized model should account for the following major chemical and physicochemical reactions: (a) rate of initial biotransformation of organic wastes, organized according to functional groups; (b) rate of bioconversion of organic wastes into carbon dioxide and water; (c) rate of waste sorption and equilbrium partition coefficient for the organic carbon portion of subsurface soils, for each functional group; (d) rate of adsorption and desorption of the organic materials onto minerals; (e) rate of hydrolysis by functional group in both pore water and in the liquid injected. In this way, the hydrolysis can be sorted into reactions for both "new" and "aged" disposal wells; (f) effects of temperature on the biokinetics, sorption and hydrolysis reactions, at depth.

2. Experiments which measure biodegradation, sorption and hydrolysis under laboratory conditions which closely simulate generic deep subsurface environments. Selected experiments with typical organic wastes would be used to improve the theoretical model, and might uncover additional important reactions of organic compounds in an abiotic environment.

3. Development of instrumentation to identify subsurface bacteria, and to monitor their

growth as a function of waste organic nutrients in the laboratory. An excellent approach appears to be a laser induced fluorescence instrument coupled with selected materials which give a "fingerprint" typical of specific bacteria (44).

4. Samples of soil at the depths of disposal sites. The soil would be analyzed for its organic carbon content. Knowledge of the OC content would help in development of the predictive model.

5. Samples of bacteria from the disposal well. Biotransformation may be the ultimate fate of the organic wastes; therefore, it is imperative that the native microorganisms be identified and their rates of biodegradation measured. In addition, bacteria introduced by injection of the wastes should be identified by sampling the disposal site.

6. Assessment of any advantage of organic wastes disposal in very deep wells, e.g., below 10,000 feet (3000 m). Computer modeling with an appropriate code would be used. The temperatures (e.g., 85 ° C) and pressures in very deep wells may be sufficient to thermally decompose the hazardous organic substances into harmless degradation products. One related study is the recent publication by Takach et al. (45) on the stability of natural gas to 29,000 feet, which utilizes thermodynamic calculation of equilibrium compositions.

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LIST OF TABLES

Table 1-1 Organic wastes injected into deep subsurface environments (2, 13); mainly up to 1973.

Description of waste	Depth of well (ft)	Description of formation	Ref.
Aldehydes			
Chlorinated aldehydes (1.9%); acetic acid (1.3%); acetaldehyde (0.3%); pH = 5	5,400	Unconsolidated sands ranging in thickness from 100 to 200 ft, separated by thin shale beds ϕ = 30-40%, k=0.5-2.3 darcys	2
Formaldehyde (0.4%); acetaldehyde (0.4%); butyonaldehyde (0.3%); crotonaldehyde (0.2%); methyl alcohol (0.2%); butyl alcohol (0.14%); acrolein (0.02%); formic acid (0.01%); acetic acid (0.01%)	4,500	Unconsolidated sand ϕ = 30-40%, k=1.0-3.0 darcys	2
Acetaldehyde (750 ppm); propanol (100 ppm); acetone (350 ppm); acrolein (100 ppm); butanol (150 ppm); methyl ethyl ketone (300 ppm); vinyl methanol ketone (600 ppm); cyclobutanone (600 ppm); dioxane (100 ppm); NaCl (5,000 ppm); $NaHCO_3$ (1,000 ppm); pH = 7.3;	4,000	Sandstone and detrital granite ϕ = 25%, k = 500 - 1,000 md	2
Alcohols			
Hexanol (0.10%); amyl alcohol (0.06%); methanol (0.02%); dibasic acids (0.82%); hexamethylene imine (0.14); cyclohexane (0.02%); dodecane (0.01%); $NaNO_3$ (1.3%); $NaHCO_3$ (0.35%); unidentified organics (2.40%); pH = 9.1	3,300	Loosely consolidated sand - 260 ft thick, ϕ = 30-35%, k = 1.0 - 2.0 darcys	2

Description of waste	Depth of well (ft)	Description of formation	Ref.
Polyvinyl alcohol (300 ppm); methanol (1,400 ppm); acetic acid (400 ppm); hydroquinone (100 ppm); silicones (23 ppm); vinyl acetate, (1,200 ppm); methyl acetate (800 ppm); acetaldehyde (500 ppm); ethyl acetate (50 ppm); sodium acetate (2,300 ppm); pH = 5	7,000	Sandstone interbedded with shale.	2
Glycols			
Ethylene glycol (1.0%); K_2CO_3 (1.0%);	5,000	Unconsolidated	2
Ethylene glycol (500 ppm); propylene dichloride (125 ppm); propylene glycol (11,000 ppm); acetone (40 ppm); ethylene dichloride (1,200 ppm); dichloroisoproyl ether (90 ppm); dichloroethyl ether (40 ppm); NaCl (5%); Na_2SO_4 (0.05%); Na_2CO_3 (0.01%);	6,000	Unconsolidated sand	2
Phenols			
Phenols (6.2%); cyanides (1.2%); ammonia (0.3%); thiocyanides (0.1%); NaCl (0.3%);	1,800	Sandsone - $\phi = 15\%$, k = 200 md	2

Description of waste	Depth of well (ft)	Description of formation	Ref.
Acids			
Acetic acid (0.5%); chloroacetic acid (0.4%); acetaldehyde (0.1%); acetaldol (0.1%); Butanol (0.05%); crotonaldehyde (0.05%); NaCl (0.5%); pH = 2.5; COD = 29,400 ppm; BOD = 9,900 ppm	3,500	Unconsolidated sand - ϕ = 27 - 35%, k= 0.5 - 2 darcys	2
Adipic acid (8%); caprolactum (1%); butanol (0.5%); benzene (0.2%); cyclohexane (0.3%); NaCl (2%);	6,000	Sandstone - ϕ = 28%, k = 0.2-1.0 darcy	2
Organic acids (dibasic - principally adipic) (2.6%) nitric acid (0.8%)	5,200	Loosely consolidated sand	2
Acetic acid (3,000 ppm); paratoluic acid (100 ppm); benzoic acid (50 ppm); xylene (100 ppm); methyl ethyl ketone (50 ppm); $CaCl_2$ (200 ppm); $MgSO_4$ (200 ppm); pH = 3.0	6,000	Sandstone - ϕ = 30% k = 500 md	2
C_2–C_6 organic acids (6,700 ppm); C_1–C_4 alcohols (2,000 ppm); C_1–C_3 ketones (1,400 ppm); propylene glycols (400 ppm); propyl esters (2,000 ppm); propylene oxide (3,000 ppm); C_5–C_6 hydrocarbons (2,000 ppm); Na_2SO_4 (2,000 ppm); NaCl (500 ppm);	7,000	Sandstone ϕ = 27%, k = 300 md	2

Description of waste	Depth of well (ft)	Description of formation	Ref.
Acetic acid (160 ppm); maleic acid (100 ppm); xylene sulfonic acid (50 ppm); benzoic acid (50 ppm); butyl alcohol (950); styrene (100 ppm); isoproponal (100 ppm); phthalic acid (300 ppm); methyl ethyl ketone (250 ppm); NaOH (650 ppm); H_2SO_4 (500 ppm); Na_2CO_3 (350 ppm);	7,200	Sandstone containing beds of clay $\phi = 26\%$, k=200 md	2
Nitriles			
Glycol nitrile (0.5%); iminodiacetonitrile (0.3%); nitrilotriacetonitrile (0.2%); other organic nitriles (1.0%); methanol (0.1%); methyl formate (0.1%); formaldehyde (0.3%); formic acid(0.5%); H_2SO_4 (1.7%); $(NH_4)_2SO_4$ (4.3%);	6,500	Sandstone - 400 ft thick, $\phi = 28\%$, k = 200 md	2
Disulfides			
Ethyl disulfide (30%); propyl disulfide (40%); butyl disulfide (25%); mercaptans (5%); water insoluble oil	2,200	Unconsolidated sand with thin clay beds 100 ft thick	2
Ethyl disulfide (4%); propyl disulfide (6%); butyl disulfide (14%); pentyl disulfide (14%); hexyl disulfide (3%); NaOH (8%);	1,500	Limestone - vugular	2

Table 1-2 Selected geologic formations used for organic waste disposal (2).

Type of Formation	Formation	Location	Depth (ft)
Unconsolidated sand	Nacatoch	Louisiana	1,000
	Cockfield		3,000
	Catahoula	Texas	5,000
	Glorieta		1,300
	Frio		7,500
Sandstone	Eutaw	Florida	3,500
	Mount Simon	Illinois	4,000
	Tar Springs	Indiana	2,300
	Bethel		2,800
	Eau Claire		4,000
	Mount Simon		5,500
	Sylvania	Michigan	1,000
	Yeso	New Mexico	1,000
	Burgoon	Pennsylvania	1,000
	Oriskany		5,500
	"Granite Wash"	Texas	5,000
	Greta		4,500
Vugular carbonate	Lake City	Florida	1,800
	Cedar Valley	Illinois	2,500
	Arbuckle	Kansas	4,000
	Virginian		3,200
	St. Peter	Kentucky	1,000
	Dundee	Michigan	4,000
	Arbuckle	Oklahoma	2,000
	Bass Islands	Pennsylvania	1,600
	San Andres	Texas	5,000

Table 1-3 Properties of geologic material from three types of underground injection formations (2).

Unconsolidated Sand			Sandstone			Vugular Limestone		
Depth (ft)	Φ (%)	k (md)	Depth (ft)	Φ (%)	k (md)	Depth (ft)	Φ (%)	k (md)
4,442	35.4	452	2,466	13.7	505	5,021	17.5	12.3
4,458	37.2	3,185	2,467	14.0	417	5,021	15.2	5.3
4,512	35.9	958	2,468	15.1	482	5,022	21.0	5.8
4,527	32.8	4,200	2,469	16.6	289	5,022	22.0	4.6
4,540	30.0	943	2,470	16.7	330	5,022	16.8	58.9
4,625	31.1	2,980	2,471	11.4	197	5,022	19.0	83.8
4,636	32.5	4,750	2,472	13.2	165	5,023	12.9	4.2
4,674	31.3	3,930	2,473	14.6	413	5,023	14.5	1.7
4,682	29.8	2,560	2,474	17.2	229	5,023	19.5	5.5
4,696	29.6	2,020	2,475	18.1	147	5,023	19.5	4.6
4,706	35.3	1,880	2,476	16.6	962	5,033	16.5	1.1
4,716	31.2	5,800	2,477	17.5	885	5,033	16.0	7.5
4,877	25.2	12	2,478	12.1	124	5,034	12.9	0.7
4,898	31.1	5,120	2,479	7.1	3	5,034	15.5	4.6
4,911	32.6	4,210	2,480	15.8	665	5,246	18.4	0.7
4,922	28.6	2,500	2,481	14.8	367	5,246	17.9	0.6
4,940	34.5	988	2,482	12.9	780	5,247	17.3	0.5
4,951	33.9	1,830	2,483	15.2	845	5,247	16.7	0.6
4,962	33.1	2,270	2,484	16.0	862	5,247	18.6	0.6
4,970	34.0	1,626	2,485	14.7	450	5,247	18.2	0.5

Table 1-4a Adsorption of neutral and basic organonitrogen compounds by clay/oil shale mixtures (5:1 weight ratios) (23).

Clay	% Total N adsorbed	% Basic N adsorbed	% Total weight adsorbed	Ion exchange capacity meq/100g
Montmorillonite (Mont)	50	92	29	99
K-Mont	40	84	27	
Na-Mont	55	92	26	
Ca-Mont	55	97	34	
Mg-Mont	70	>99	30	
Cu-Mont	70	>99	38	
Halloysite	40	83	18	26
Kaolinite	30	65	11	13
Muscovite	10	20	2	2

Table 1-4b Adsorption of selected neutral and basic nitrogen compounds by ion-exchanged montmorillonite (23).

Organic Nitrogen Compound	Exchangeable cation				
	K^+	Na^+	Ca^{++}	Mg^{++}	Cu^{++}
n-Butyronitrile	25	40	30	30	15
Pyridine	16	8	2	<1	<1
2,6-Dimethylpyridine	24	10	7	1	<1
2,5-Dimethylpyrrole	3	3	<1	<1	<1
Quinoline	24	21	9	5	<1
Indole	23	26	12	12	<1
Stearonitrile	40	60	55	45	30

Table 1-5 Examples of microorganisms present in subsoils near the surface.

Material or Microorganism	Organic Chemical Reacted	Ref.
Arthrobacter		5
Pseudomonas		5
Enterobacter		5
Methanogenic Aquifer		6
Material	1,1-Dichloroethylene	6
	trans-1,2-Dichloroetheylene	6
	cis-1,2-Dichloroethylene	6
	Trichloroethylene	6
	1,2-Dibromoethane	6
	Benzene	6
	Toluene	6
	Ethylbenzene	6
	o-Xylene	6
Organic Sediment from		7
the Everglades	1,1-Dichloroethene	7
	cis-1,2-Dichloroethene	7
	trans-1,2-Dichloroethene	7
Estuarine Water	Phenol	8
	p-Chlorophenol	8
	2,4-Dichlorophenol	8
	2,4,5-Trichlorophenol	8
	Pentachlorophenol	8
Alluvial Groundwater	Alkylpyridines	9
Sea Water	Naphthalene; Toluene	10
Soil Samples,		11
30 to 457 cm	Trichloroethylene; 1,2-Dichloroethylene	11
Interstitial Waters		12
of a Sediment		12
0-41 cm. depth	Polychlorinated Biphenyls (PCBs)	12

Table 3-1 Sediments and soils--physical properties (16)

Location	% O.C.	pH	CEC me. 100 g	Silt	Clay	Swelling Clay
Missouri River, Stanton, N. Dak.	2.07	7.79	23.7	41.8	55.2	40.1
Missouri River, Lake Oahe, N. Dak.	2.28	7.44	19.0	35.4	31.0	25.7
Missouri River, Big Bend Lake, S. Dak.	0.72	7.83	33.0	31.2	68.6	60.8
Missouri River, Onawa, Iowa	0.15	8.32	3.7	10.7	6.8	6.1
Loess sample, Turin, Iowa	0.11	8.34	12.4	75.6	17.4	16.3
Ohio River, Ceredo, W. Va.	3.04	6.90	11.86	27.1	52.6	-
Soil eroded hillside, Ceredo, W. Va	0.48	4.54	18.9	34.4	63.6	13.8
Ohio River, Leavenworth, Ind.	0.95	7.79	11.3	48.7	35.7	10.1
Mississippi River, Columbus, Ky.	0.66	7.76	15.4	25.8	39.5	29.7
Soil, Fern Clyffe State Park, Ill.	1.30	5.5	8.5	71.4	28.6	21.9
Illinois River, Lorenzo, Ill.	1.88	7.60	8.3	42.7	7.1	2.8
Illinois River, Lacon, Ill.	1.67	7.55	8.5	52.7	21.2	14.8
Confluence of Illinois and Sangamon Rivers	2.38	6.70	31.2	13.6	69.1	57.6
Mississippi River, McClure, Ill.	1.48	7.75	20.9	55.4	42.9	37.1
Small stream, Watkinsville, Ga.	1.21	6.35	3.7	13.9	18.6	2.0

Table 3-2a Pyrene and methoxychlor sorption coefficients for linear portion of isotherms (15).

Sediment size fraction	Organic carbon	Pyrene K_p (r^2)		Pyrene K_{oc} ($\times 10^{-5}$)	Methoxychlor K_p (r^2)		Methoxychlor K_{oc} ($\times 10^{-5}$)
Hickory Hill							
Sand	0.13	42	(0.85)	0.32	53	(0.85)	0.41
Coarse silt	3.27	3000	(0.95)	0.92	2600	(0.97)	0.80
Medium silt	1.98	2500	(0.95)	1.3	1800	(0.91)	0.91
Fine silt	1.34	1500	(0.90)	1.1	1400	(0.97)	1.0
Clay	1.20	1400	(0.75)	1.2	1100	(0.99)	0.92
Doe Run							
Sand	0.086	9.4	(0.97)	0.11	8.3	(0.98)	0.097
Coarse silt	2.78	2100	(0.92)	0.76	2200	(0.93)	0.80
Medium silt	2.34	3000	(0.80)	1.3	1700	(0.94)	0.73
Fine silt	2.89	3600	(0.88)	1.2	2300	(0.95)	0.80
Clay	3.29	3800	(0.90)	1.2	2400	(0.98)	0.73
Oconee River							
Sand	0.57	68	(0.38)	0.12	95	(0.93)	0.17
Coarse silt	2.92	3200	(0.99)	1.1	2500	(0.97)	0.86
Medium silt	1.99	2300	(0.96)	1.2	2000	(0.93)	1.0
Fine silt	2.26	2500	(0.99)	1.1	2100	(0.96)	0.93
Clay*							

* The clay portion of this sediment was allowed to age in suspension and degraded substantially. Therefore, no sorption was done on this fraction.

Table 3-2b Soil OC normalized sorption coefficients (K_{OC}) (Ref. 20)

Compound	Sorption coefficient (K_{OC})		
	Apison[a]	Fullerton[b]	Dormont[c]
Ketones			
Acetophenone	185 ± 8[d]	270 ± 80	105 ± 4
2-Acetonaphthone	1200 ± 100	410 ± 80	950 ± 20
Benzophenone	580 ± 100	530 ± 130	440 ± 30
4-Acetylbiphenyl	2400 ± 200	710 ± 50	1900 ± 120
9-Acetylanthracene	8400 ± 1200	1170 ± 230	1750 ± 160
Alcohols			
Benzyl Alcohol	<5	<5	<5
Sec-Phenethylalcohol	37 ± 2	<5	52 ± 4
1-Naphthalenemethanol	165 ± 12	<5	270 ± 14
4-Biphenylmethanol	700 ± 35	105 ± 2	495 ± 70
9-Anthracenemethanol	8000 ± 3300	1500 ± 50	2700 ± 480
Phenols			
Phenol	55 ± 25	710 ± 75	7 ± 7
p-Cresol	3420 ± 970	3350 ± 580	115 ± 19
3,5-Dimethylphenol	460 ± 90	1400 ± 400	190 ± 40
5-Indanol	11,500 ± 1900	10,000 ± 2470	240 ± 40
2,3,5-Trimethylphenol	5700 ± 2750	6400 ± 570	260 ± 4
1-Naphthol	369,000 ± 128,000	>600,000 ± 300,000	1280 ± 340
Nonplar compounds			
Naphthalene	1000 ± 80	960 ± 50	400 ± 52
Biphenyl	3300 ± 260	900 ± 60	870 ± 65
Phenanthrene	5900 ± 420	1400 ± 200	5800 ± 375
1,4-Dichlorobenzene	665 ± 105	850 ± 270	280 ± 105
1,2,4-Trichlorobenzene	2100 ± 360	1300 ± 610	885 ± 160

[a]0.1% OC.
[b]0.06% OC.
[c]1.2% OC.
[d]Mean ± S.E., n = 3-6.

Table 3-3 Water solubilities (S), molar volumes ($\bar{V}$), octanol-water partition coefficients (K_{ow}), and soil organic matter-water distribution coefficients (K_{om}) of selected organic solutes (21).

Compound	log S, mol/L	V, L/mol	log ($S\bar{V}$)	log K_{om}	log K_{ow}
benzene	-1.64	0.0894	-2.69	1.26	2.13
anisole	-1.85	0.109	-2.82	1.30	2.11
Chlorobenzene	-2.36	0.102	-3.35	1.68	2.84
ethylbenzene	-2.84	0.123	-3.75	1.98	3.15
1,2-dichlorobenzene	-2.98	0.113	-3.98	2.27	3.38
1,3-dichlorobenzene	-3.04	0.114	-3.98	2.23	3.38
1,4-dichlorobenzene	(-3.03)	0.118	-3.96	2.20	3.39
1,2,4-trichlorobenzene	-3.57	0.125	-4.47	2.70	4.02
2-PCB	(-4.57)	0.174	-5.33	3.23	4.51
2,2′-PCB	(-5.08)	0.189	-5.57	3.68	4.80
2,4′-PCB	(-5.28)	0.189	-5.97	3.89	5.10
2,4,4′-PCB	(-5.98)	0.204	-6.67	4.38	5.62

*The listed solubilities are the 20-25 ° C values. The numbers in parentheses are the supercooled liquid solute solubilities. For 2-, 2,2', 2,4'-, and 2,4,4'-PCB, the calculations were based on their solid solubilities of 3760, 717, 637, and 115 μg/L at 20 ° C, respectively and an assumption of 13.5 cal/(mol K) or their entropies of fusion. The molar volumes of PCBs are estimated by using the densities of liquid Aroclor mixtures that have approximately the same chlorine atoms as the individual PCBs.

Table 3-4 Half-lives of biotransformation modeled with first-order batch kinetics as a function of active organism concentration (46).

Organism concentration		Degradation half-life, days	
mg/L	No./ml*	Aerobic respiration†	Methanogenesis§
10.	10^7	0.014	0.14
1.	10^6	0.14	1.39
0.1	10^5	1.39	13.9
0.01	10^4	13.9	139.
0.001	10^3	139.	1,390.

* Organism dry weight taken as 10^{-12}g/cell
† $k/K_s = 5$ l/mg cells–day
§ $k/K_s = 0.5$ l/mg cells–day

Table 3-5 Hydrolysis half-life of selected organic substances. Data are from Mabey and Mill (33), and (34, 37) for pH=7, 25 ° C, and zero ionic strength.

organic substance	$t_{1/2}$
CH_2Cl_2	704 yr
CH_2BrCl	44 yr
CH_2Br_2	183 yr
$CHCl_3$	3500 yr
$CHBrCl_2$	137 yr
$CHBr_2Cl$	274 yr
$CHBr_3$	686 yr
$CHICl_2$	275 yr
CHFICl	1.0 yr
CCl_4	7000 yr (1 ppm), 7 yr (1000 ppm)
CH_3F	30 yr
CH_3Cl	0.93 yr
CH_3Br	20 day
CH_3I	110 day
C_2H_5Cl	38 day
C_2H_5Br	30 day
C_2H_5I	49 day
$(CH_3)_2CHCl$	38 day
$(CH_3)_2CHBr$	2.1 day
$(CH_3)_2CHI$	2.9 day
$CH_3CH_2CH_2Br$	26 day
$(CH_3)_3CF$	50 day
$(CH_3)_3CCl$	23 sec
$CH_2{=}CHCH_2Cl$	69 day
$CH_2{=}CHCH_2Br$	12 hr
$CH_2{=}CHCH_2I$	2.0 day
$C_6H_5CH_2Cl$	15 hr
p–$CH_3C_6H_4CH_2Cl$	0.43 hr
$C_6H_5CHCl_2$	0.1 hr
$C_6H_5CCl_3$	19 sec
$C_6H_5CH_2Br$	1.32 hr
p–$CH_3C_6H_4CH_2Br$	4.3 min
$CH_3COOC_2H_5$	2.0 yr
CH_3CONH_2 (acetamide)	3950 yr

7.0 APPENDIX

The organic substances tabulated in this Appendix are included because they are listed in the Groupings of wastes, in Reference 47. Other organic compounds are included if they are likely to be found in a subsurface environment, or if they provide useful data such as sorption measurements. The intent of this tabulation is to provide values of half-lives for hydrolysis and biotransformation reactions, and equilibrium sorption values at the soil/water interface. Data are largely at 25 °C and atmospheric pressures. These data then can provide the basis for predicting the rates and equilibrium values in the deep subsurface, after modification of the appropriate mathematical equations. There are numerous gaps in the tables, representing a lack of experimental values. An especially large gap is represented by rates of biological transformations. Our calculations have been limited to sorption coefficients, estimated from octanol/water partition coefficients using eq 4.

The organic wastes are organized into the following major groupings:

LITERATURE CITED IN THE APPENDIX

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7. Not used.

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10. CHEMFATE, Environmental Fate Data Base, Syracuse Research Corporation, Merrill Lane, Syracuse, New York 13210-4080 (March 1986).

11. Not used.

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Toxicology of Health and Human Services, Washington, D.C., U.S. Department of Health and Human Services (1981).

13. "Dictionary of Organic Compounds", Chapman and Hall, New York (1982).

14. "Dangerous Properties of Industrial Materials", N.I.Sax, 6th ed., Van Nostrand Reinhold, New York (1984).

15. W.Mabey; T.Mill: "Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions", J.Phy.Chem.Ref.Data 1978, v.2, 383.

16. J.P.Bell; M.Tsezos: "Removal of Hazardous Organic Pollutants by Biomass Adsorption", J.Water Poll.Control Fed. 1987, v.59, 191.

17. This work, normally eq 4.

CONVERSION TABLE

1 Pa (Pascal) = 10^{-5} bar = 0.00750062 torr

1 atm = 760 torr

1 torr = 1 mm Hg

1 kPa = 1000 Pa

1 mg/L = 1 g/m^3

1 kPa m^3/mol = .0009869 atmos. m^3/mol

1 kPa = 7.50062 torr

1 m = 3.279 ft

ATOMIC WEIGHTS OF SELECTED ELEMENTS

Oxygen: 15.9994

Hydrogen: 1.0080

Nitrogen: 14.0067

Sulfur: 32.064

Carbon: 12.0112

Phosphorus: 30.9738

FORMAT FOR PROPERTY VALUES OF WASTE ORGANICS

For each pure organic substance in the Appendix, the Grouping category is given, followed by the name of the organic and the date identifying when the data were tabulated. Other commonly used names for the organics are given, together with the Chemical Abstracts Services (CAS) number. For purposes of identification, we also include the Hazardous Waste Number, and an Industry/EPA Generic No. The Industry/EPA Generic No. is not, however, related to the source of the waste injected into the subsurface disposal system. The empirical chemical formula is also given. Under the heading "Description", there is a listing of selected physical properties of the pure substance, and a reference to source of the data. The physical properties are intended to provide information on the organic chemical to be used in predicting its form in the deep subsurface, e.g., gaseous, soluble in water, or solid. The general heading Retention properties is defined as the chemical and biochemical reactions which determine the fate of the organic within the injection zone. These values are all at 25 ° C and about 1 bar pressure.

The data in the tabulation of the Appendix are the database for laboratory conditions which are to be used in predicting the fate of organic wastes disposed to the deep subsurface by injection wells.

Other Names:

CAS No.:
Hazardous Waste No.:
Industry/EPA Generic No.:
Formula: C7H7ClN2S

Description:

- -

Physical properties:	Ref.
Molecular weight:	
Melting point (C):	
Boiling point (C):	
Density (g/cc, 20 C):	
Vapor pressure (torr, 25 C):	
Henry's law constant (atm m**3 mole**-1, 25 C):	
Solubility in water (mg/L, 25 C):	

- -

Retention properties:	Ref.
log (octanol/water) partition (25 C):	
Partition coefficient, soil/water:	
Hydrolysis rate in water (t1/2, month**-1, 25 C):	
Biodegradation rate in water (t1/2, month**-1):	

7.1 Halogenated Solvents

August 1987 HALOGENATED SOLVENTS
CAS #: 542-88-1 bis(Chloromethyl) ether

Other Names: sym-Dichloromethyl ether; Oxybis[chloromethane]; BCME; Chloro(chloromethoxy)methane; Chloromethyl ether; Dichlorodimethyl ether; alpha-alhpa'-Dichlorodimethyl ether; Monochloromethyl ether
Haz Waste #: P016 Ind/EPA Gen #:
Formula: (CH2-Cl)2O; C2H4Cl2O
Description: Colorless liquid; suffocating odor; strong irritant to eyes, respiratory tract; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	114.97	2
Boiling point (C):	106.00	2
Density (g/cc, 20C):	1.3150	2
Solubility in water (mg/L, 25C):	Decomposed by water into HCl and formaldehyde	2
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	-0.38	3
Partition coefficient, soil/water:	0.0750	17
Hydrolysis rate, water (1/month, 25C):	Very rapid, to form HCl and HCHO	3
Biodegradation rate in water (1/month):	Not important	3

August 1987 HALOGENATED SOLVENTS
CAS #: 108-90-7 Chlorobenzene

Other Names: Monochlorobenzene; Benzene Chloride
Haz Waste #: U037 Ind/EPA Gen #: F002,K015,K105,K085
Formula: C6H5Cl

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	112.56	1
Melting point (C):	-45.34	1
Boiling point (C):	131.70	1
Density (g/cc, 20C):	1.1012	1
Vapor pressure (torr, 25C):	12.0000	5
Henry's law const (atm m**3/mol, 25C):	0.39300E-02	3
Solubility in water (mg/L, 25C):	488.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.84	3
Partition coefficient, soil/water:	61.4000	17
Biodegradation rate in water (1/month):	Bioaccumulated and biodegraded	3

August 1987 HALOGENATED SOLVENTS
CAS #: 67-66-3 Chloroform

Other Names: Trichloromethane; Formyl trichloride; Freon 20; R 20; Methane trichloride; Methenyl trichloride; Methyl trichloride; NCI-C02686; Trichloroform
Haz Waste #: U044 Ind/EPA Gen #:
Formula: CHCl3
Description: Highly refractive, non-flammable, heavy, very volatile, sweet tasting liquid (Ref. 1); banned by the FDA from use in drug, cosmetic and food packaging products in 1976; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	119.39	2
Melting point (C):	-63.50	2
Boiling point (C):	61.70	3
Density (g/cc, 20C):	1.484; 1.48069 specific gravity, 25 C (Ref. 2)	1
Vapor pressure (torr, 25C):	150.00	3
Henry's law const (atm m**3/mol, 25C):	0.33900E-02	3
Solubility in water (mg/L, 25C):	8200.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.97	3
Hydrolysis rate, water (1/month, 25C):	450.00	4
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 95-50-1 1,2-Dichlorobenzene

Other Names: o-Dichlorobenzene; Orthodichlorobenzene
Haz Waste #: U070 Ind/EPA Gen #: F002,K042,K085,K105
Formula: 1,2-C6H4Cl2
Description: Liquid; can cause injury to liver, kidneys; high concentrations cause CNS depression (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	147.00	1
Melting point (C):	-16.97	1
Boiling point (C):	180.40	1
Density (g/cc, 20C):	1.3022	1
Vapor pressure (torr, 25C):	1.5000	3
Henry's law const (atm m**3/mol, 25C):	0.19400E-02	3
Solubility in water (mg/L, 25C):	145.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.38	3
Partition coefficient, soil/water:	189.00	17
Biodegradation rate in water (1/month):	Bioaccumulated	3

August 1987 HALOGENATED SOLVENTS
CAS #: 541-73-1 1,3-Dichlorobenzene

Other Names: m-Dichlorobenzene
Haz Waste #: U071 Ind/EPA Gen #: K085,K105
Formula: 1,3-C6H4Cl2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	147.00	1
Melting point (C):	-24.76	1
Boiling point (C):	173.00	1
Density (g/cc, 20C):	1.2828	1
Vapor pressure (torr, 25C):	2.2800	3
Henry's law const (atm m**3/mol, 25C):	0.26300E-02	3
Solubility in water (mg/L, 25C):	123.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.38	3
Partition coefficient, soil/water:	189.00	17
Biodegradation rate in water (1/month):	Bioaccumulates	3

August 1987 HALOGENATED SOLVENTS
CAS #: 764-41-0 1,4-Dichloro-2-butene

Haz Waste #: U074 Ind/EPA Gen #:
Formula: ClCH2CH=CHCH2Cl; C4H6Cl2
Description: Highly toxic by inhalation; suspected carcinogen (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	125.00	13

August 1987 HALOGENATED SOLVENTS
CAS #: 75-71-8 Dichlorodifluoromethane

Other Names: Freon-12
Haz Waste #: U075 Ind/EPA Gen #:
Formula: CCl2F2
Description: Almost odorless gas; can react violent with Al or Mg (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	121.00	13
Melting point (C):	-155.00	13
Boiling point (C):	-29.80	13

August 1987 HALOGENATED SOLVENTS
CAS #: 75-34-3 1,1-Dichloroethane

Other Names: Ethylidene dichloride; Ethylidene chloride
Haz Waste #: U076 Ind/EPA Gen #:
Formula: Cl2CHCH3; C2H4Cl2
Description: Oily liquid; odor and taste as of chloroform; narcotic in high concentrations (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	98.96	3
Melting point (C):	-97.00	3
Boiling point (C):	57.30	3
Density (g/cc, 20C):	(25 C) 1.1680	2
Vapor pressure (torr, 25C):	180.00	3
Henry's law const (atm m**3/mol, 25C):	0.54500E-02	3
Solubility in water (mg/L, 25C):	(20 C) 5500.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.79	3
Partition coefficient, soil/water:	6.9000	17
Biodegradation rate in water (1/month):	Degradation significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 107-06-2 1,2-Dichloroethane

Other Names: Ethylene dichloride; Borer sol; Brocide; Dichloremulsion; Destruxol borer-sol; sym-Dichloroethane; Di-chlor-mulsion; Dichlor-mulsion; alpha,beta-Dichloroethane; EDC; ENT 1656; Dichloroethylene; Ethane dichloride; Freon 150; Glycol dichloride; NIC-C00511; Ethylene chloride; Dutch liquid
Haz Waste #: U077 Ind/EPA Gen #: K019
Formula: CH2ClCH2Cl; C2H4Cl2
Description: Heavy liquid; pleasant odor; sweet taste; vapors are irritating to the respiratory tract and conjunctiva; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	98.98	3
Melting point (C):	-35.40	3
Boiling point (C):	83.50	3
Density (g/cc, 20C):	1.2569	2
Vapor pressure (torr, 25C):	(20 C) 61.0000	3
Henry's law const (atm m**3/mol, 25C):	0.11000E-02	3
Solubility in water (mg/L, 25C):	(20 C) 8690.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.48	3
Partition coefficient, soil/water:	3.6200	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 75-35-4 1,1-Dichloroethylene

Other Names: 1,1-Dichloroethene; Vinylidene chloride;
asym-Dichloroethylene
Haz Waste #: U078 Ind/EPA Gen #:
Formula: CH2=CCl2; C2H2Cl2
Description: Liquid; mild, sweet odor resembling that of chloroform;
irritant to skin, mucous membranes; narcotic in high
concentrations; caused kidney and liver damage in
experimental animals (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	96.94	5
Melting point (C):	-122.10	5
Boiling point (C):	37.00	5
Vapor pressure (torr, 25C):	591.00	3
Henry's law const (atm m**3/mol, 25C):	0.0150	3
Solubility in water (mg/L, 25C):	400.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.48	3
Partition coefficient, soil/water:	3.6200	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 156-59-2 cis-1,2-Dichloroethylene

Other Names: cis-1,2-Dichloroethene
Haz Waste #: U079 Ind/EPA Gen #:
Formula: cis-CHCl=CHCl

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	96.95	1
Melting point (C):	-80.50	5
Boiling point (C):	60.20	1
Density (g/cc, 20C):	(15 C) 1.2917	1
Vapor pressure (torr, 25C):	27.4600	5
Henry's law const (atm m**3/mol, 25C):	0.75100E-02	5
Solubility in water (mg/L, 25C):	3500.00	5

August 1987 HALOGENATED SOLVENTS
CAS #: 540-59-0 trans-1,2-Dichloroethylene

Other Names: 1,2-Dichloroethene; Acetylene Dichloride; Dioform;
alpha,beta-Dichloroethylene; sym-Dichloroethylene
Haz Waste #: U079 Ind/EPA Gen #:
Formula: trans-CHCl=CHCl
Description: Colorless, mobile liquid, sweet odor

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	96.95	1
Melting point (C):	-49.44	1
Boiling point (C):	47.70	1
Density (g/cc, 20C):	(10 C) 1.2631	1
Vapor pressure (torr, 25C):	200.00	3
Henry's law const (atm m**3/mol, 25C):	0.53200E-02	3
Solubility in water (mg/L, 25C):	600.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.48	3
Partition coefficient, soil/water:	3.6200	17
Hydrolysis rate, water (1/month, 25C):	Probably slow	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 78-87-5 1,2-Dichloropropane

Other Names: Propylene dichloride
Haz Waste #: U083 Ind/EPA Gen #:
Formula: CH2ClCHClCH3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	113.00	3
Melting point (C):	-100.00	3
Boiling point (C):	96.80	3
Vapor pressure (torr, 25C):	(20 C) 42.0000	3
Henry's law const (atm m**3/mol, 25C):	0.28200E-02	3
Solubility in water (mg/L, 25C):	(20 C) 2700.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.28	3
Partition coefficient, soil/water:	19.1500	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 542-75-6 1,3-Dichloropropene

Other Names: 1,3-Dichloropropylene
Haz Waste #: U084 Ind/EPA Gen #:
Formula: cis and trans-ClCH2CH=CHCl

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	111.00	3
Boiling point (C):	104. (cis); 112. (trans)	3
Vapor pressure (torr, 25C):	(20 C) 25.0000	3
Henry's law const (atm m**3/mol, 25C):	0.35500E-02	3
Solubility in water (mg/L, 25C):	2700. (cis); 2800. (trans)	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 75-69-4 Fluorotrichloromethane

Other Names: Trichlorofluoromethane; Freon-II; Freon 11; Frigen 11; Trichloromonofluoromethane; Arcton 9
Haz Waste #: U121,U229 Ind/EPA Gen #: F002
Formula: CCl3F
Description: Liquid at temperatures below 23.7; faint ethereal odor; non-flammable; decomposes into harmful materials by flames or high heat; may be narcotic in high concentrations; use as an aerosol propellant regulated by government (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	137.38	2
Melting point (C):	-111.00	3
Boiling point (C):	23.80	3
Density (g/cc, 20C):	(25 C, gas, air=1) 5.0400	2
Vapor pressure (torr, 25C):	(20 C) 667.00	3
Henry's law const (atm m**3/mol, 25C):	0.0583	3
Solubility in water (mg/L, 25C):	1100.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.53	3
Partition coefficient, soil/water:	32.2000	17
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 630-20-6 1,1,1,2-Tetrachloroethane

Haz Waste #: U208 Ind/EPA Gen #:
Formula: Cl3CCH2Cl; C2H2Cl4
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	168.00	13
Boiling point (C):	135.10	13
Density (g/cc, 20C):	(25 C) 1.5420	13

August 1987 HALOGENATED SOLVENTS
CAS #: 79-34-5 1,1,2,2-Tetrachloroethane

Other Names: Acetylene tetrachloride; Tetrachloroethane; Cellon; sym-Tetrachloroethane; Bonoform
Haz Waste #: U209 Ind/EPA Gen #:
Formula: CHCl2CHCl2; C2H2Cl4
Description: Nonflammable, heavy, mobile liquid; sweetish, suffocating odor similar to chloroform; has the highest solvent power of the chlorinated hydrocarbons; powerful narcotic; liver poison (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	167.86	2
Melting point (C):	-36.00	3
Boiling point (C):	146.00	3
Vapor pressure (torr, 25C):	(20 C) 5.0000	3
Henry's law const (atm m**3/mol, 25C):	0.43200E-03	3
Solubility in water (mg/L, 25C):	(20 C) 2900.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.56	3
Partition coefficient, soil/water:	34.3000	17
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 127-18-4 Tetrachloroethylene

Other Names: Perchloroethylene; Ethylene Tetrachloride; Nema; Tetrachloroethene; Tetracap; Tetropil; Perclene; Ankilostine; Didakene
Haz Waste #: U210 Ind/EPA Gen #: F001,F002,K030
Formula: CCl2=CCl2
Description: Colorless, nonflammable liquid, ethereal odor

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	165.85	2
Melting point (C):	-22.70	3
Boiling point (C):	121.20	1
Density (g/cc, 20C):	1.6230	2
Vapor pressure (torr, 25C):	14.0000	3
Henry's law const (atm m**3/mol, 25C):	0.0287	3
Solubility in water (mg/L, 25C):	150.00 to 200.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.88	5
Partition coefficient, soil/water:	66.8000	17
Hydrolysis rate, water (1/month, 25C):	0.73	4
Biodegradation rate in water (1/month):	Significant	5

August 1987 HALOGENATED SOLVENTS
CAS #: 56-23-5 Carbon tetrachloride

Other Names: Tetrachloromethane; Perchloromethane; Necatorina; Benzinoform; Carbon chloride; Carbona; ENT 4705; Fasciolin; Flukoids; Freon 10; Halon 104; Methane tetrachloride; Necatorina; Tetrachlorocarbon; Tetrafinol; Tetraform; Tetrasol; Univerm; Vermoestricid
Haz Waste #: U211 Ind/EPA Gen #: F001,K016
Formula: CCl4
Description: Colorless, clear, nonflammable heavy liquid (Ref. 1); poisoning by inhalation, ingestion or skin absorption; can be fatal; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	153.84	2
Melting point (C):	-23.00	2
Boiling point (C):	76.70	2
Density (g/cc, 20C):	1.589 (25 C); specific gravity 1.59472 (20 C) (Ref. 1)	2
Vapor pressure (torr, 25C):	90.0000	3
Henry's law const (atm m**3/mol, 25C):	0.30200E-02	3
Solubility in water (mg/L, 25C):	785.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.64	3
Partition coefficient, soil/water:	40.5000	17
Hydrolysis rate, water (1/month, 25C):	Hydrolysis not likely	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 75-25-2 Bromoform

Other Names: Tribromomethane
Haz Waste #: U225 Ind/EPA Gen #:
Formula: CHBr3
Description: Heavy liquid; chloroform odor; sweetish taste; abuse may lead to habituation or addiction (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	252.80	3
Melting point (C):	8.30	3
Vapor pressure (torr, 25C):	(34 C) 10.0000	3
Henry's law const (atm m**3/mol, 25C):	0.53200E-03	3
Solubility in water (mg/L, 25C):	(15 C) 3010.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.30	3
Partition coefficient, soil/water:	19.9000	17
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 71-55-6 1,1,1-Trichloroethane

Other Names: Methylchloroform; Chlorothene
Haz Waste #: U226 Ind/EPA Gen #: F001,F002,K028,K029,K095,K096
Formula: CH3CCl3; C2H3Cl3
Description: Liquid; nonflammable; irritating to eyes, mucous membranes, and, in high concentrations, narcotic (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	133.42	2
Melting point (C):	-30.40	3
Boiling point (C):	74.00	1
Density (g/cc, 20C):	1.3249	1
Vapor pressure (torr, 25C):	(20 C) 96.0000	3
Henry's law const (atm m**3/mol, 25C):	0.49200E-02	3
Solubility in water (mg/L, 25C):	(20 C) 480.00 to 4400.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.17	3
Partition coefficient, soil/water:	9.2000	17
Hydrolysis rate, water (1/month, 25C):	180.00	4
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED SOLVENTS
CAS #: 79-00-5 1,1,2-Trichloroethane

Other Names: Vinyl trichloride
Haz Waste #: U227 Ind/EPA Gen #:
Formula: CHCl2CH2Cl; C2H3Cl3
Description: Nonflammable liquid; pleasant odor; irritating to eyes, mucous membranes, and, in high concentrations, narcotic (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	133.42	2
Melting point (C):	-36.50	3
Boiling point (C):	113.00	3
Density (g/cc, 20C):	1.4416	2
Vapor pressure (torr, 25C):	(20 C) 19.0000	3
Henry's law const (atm m**3/mol, 25C):	0.84600E-03	3
Solubility in water (mg/L, 25C):	(20 C) 4500.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.17	3
Partition coefficient, soil/water:	9.2000	17
Biodegradation rate in water (1/month):	Not significant	3

CAS #: 79-01-6 Trichloroethylene

Other Names: 1,1,2-Trichloroethene; Ethylene Trichloride; Ethinyl Trichlroide; Tri-clene; Trielene; Trichloran; Trichloren; Algylen; Trimar; Triline; Tri; Triethylene; Westrosol; Chlorylen; Gemalgene; Germalgene
Haz Waste #: U228 Ind/EPA Gen #: F001,F002,K030
Formula: CHCl=CCl2
Description: Nonflammable liquid; odor similar to chloroform; dissolves most fixed and volatile oils (Ref. 1); slowly decomposed by light in the presence of moisture; moderate exposures can cause symptoms similar to alcohol inebriation; higher concentrations have a narcotic effect (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	131.39	1
Melting point (C):	-73.00	3
Boiling point (C):	86.70	2
Density (g/cc, 20C):	1.4649	1
Vapor pressure (torr, 25C):	57.9000	3
Henry's law const (atm m**3/mol, 25C):	0.0117	3
Solubility in water (mg/L, 25C):	1100.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.29	3
Partition coefficient, soil/water:	19.5000	17
Hydrolysis rate, water (1/month, 25C):	0.89	4
Biodegradation rate in water (1/month):	Significant	3

7.2 Phthalates

August 1987 PHTHALATES
CAS #: 117-81-7 bis-(2-ethylhexyl) phthalate

Other Names: DEHP
Haz Waste #: U028 Ind/EPA Gen #:
Formula: C6H4(COOCH2CH(C2H5)C4H9)2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	391.00	3
Melting point (C):	-50.00	3
Boiling point (C):	387.00	3
Vapor pressure (torr, 25C):	0.20000E-06	3
Solubility in water (mg/L, 25C):	0.4000	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	(approx.) 8.73	3
Partition coefficient, soil/water:	0.12000E+08	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHTHALATES
CAS #: 84-74-2 di-n-Butyl phthalate

Other Names: DBP; 1,2-Benzenedicarboxylic acid dibutyl ester;
n-Butyl phthalate; Phthalic acid dibutyl ester
Haz Waste #: U069 Ind/EPA Gen #:
Formula: C6H4(COOC4H9)2; C16H2204
Description: Oily liquid; insect repellent for the impregnation of
clothing (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	278.34	2
Melting point (C):	-35.00	3
Boiling point (C):	340.00	3
Vapor pressure (torr, 25C):	0.1000	3
Solubility in water (mg/L, 25C):	13.0000	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	(approx.) 5.20	3
Biodegradation rate in water (1/month):	Rapid	3

August 1987 PHTHALATES
CAS #: 84-66-2 Diethyl phthalate

Other Names: DEP; 1,2-Benzenedicarboxylic acid, diethyl ester; Neantine; Phthalic acid ethyl ester; Ethyl phthalate; Palatinol A
Haz Waste #: U088 Ind/EPA Gen #:
Formula: C6H4(COOC2H5)2
Description: Colorless, practically odorless, oily liquid; bitter, disagreeable taste; irritating to mucous membranes, and, in high concentrations, narcotic (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	222.20	3
Melting point (C):	-40.50	3
Boiling point (C):	298.00	3
Density (g/cc, 20C):	(14 C) 1.2320	2
Vapor pressure (torr, 25C):	0.0500	3
Henry's law const (atm m**3/mol, 25C):	0.84600E-06	3
Solubility in water (mg/L, 25C):	896.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.22	3
Biodegradation rate in water (1/month):	Rapid	3

August 1987 PHTHALATES
CAS #: 131-11-3 Dimethyl phthalate

Other Names: DMP; 1,2-Benzenedicarboxylic acid, dimethyl ester
Haz Waste #: U102 Ind/EPA Gen #:
Formula: C6H4(COOCH3)2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	194.20	3
Melting point (C):	5.50	3
Boiling point (C):	282.00	3
Vapor pressure (torr, 25C):	<0.01	3
Henry's law const (atm m**3/mol, 25C):	0.32400E-06	3
Solubility in water (mg/L, 25C):	4320.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.12	3
Biodegradation rate in water (1/month):	Rapid	3

August 1987 PHTHALATES
CAS #: 117-84-0 d-n-Octyl phthalate

Other Names: DOP
Haz Waste #: U107 Ind/EPA Gen #:
Formula: C6H6(COOC8H17)2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	391.00	3
Melting point (C):	-25.00	3
Boiling point (C):	220.00	3
Vapor pressure (torr, 25C):	<0.2	3
Solubility in water (mg/L, 25C):	3.0000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	(approx.) 9.20	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHTHALATES
CAS #: 85-44-9 Phthalic anhydride

Other Names: 1,2-Benzenedicarboxylic acid anhydride;
1,3-Isobenzofurandione
Haz Waste #: U190 Ind/EPA Gen #: K023,K024,K093,K094
Formula: C8H4O3
Description: White, lustrous needles

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	148.11	2
Melting point (C):	(sublimes) 130.80	2
Boiling point (C):	295.00	2
Density (g/cc, 20C):	1.5300	2
Solubility in water (mg/L, 25C):	Soluble in 162 parts water	2

7.3 Halogenated Pesticides

August 1987 HALOGENATED PESTICIDES
CAS #: 309-00-2 Aldrin Pesticides

Other Names: 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4-endo-exo-5,8-dimethanonaphthalene; HHDN; compd 118; Octalene
Haz Waste #: P004 Ind/EPA Gen #:
Formula: C12H8Cl6
Description: Crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	364.93	2
Melting point (C):	104.00	2
Vapor pressure (torr, 25C):	0.60000E-05	3
Henry's law const (atm m**3/mol, 25C):	0.49600E-03	3
Solubility in water (mg/L, 25C):	0.0170 to 0.1800	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	5.17	3
Partition coefficient, soil/water:	7847.00	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Biotransforms to dieldrin	3

August 1987 HALOGENATED PESTICIDES
CAS #: 94-75-7 2,4-D Pesticides

Other Names: (2,4-Dichlorophenoxy)acetic acid; Hedonal; Trinoxal
Haz Waste #: P035 Ind/EPA Gen #: D016,K043,K099
Formula: C6H3Cl2OCH2COOH; C8H6Cl2O3
Description: Crystals; causes irritation to eyes, G.I. disturbances (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	221.04	1
Melting point (C):	138.00	1
Boiling point (C):	(0.4) 160.00	1

August 1987 HALOGENATED PESTICIDES
CAS #: 60-57-1 Dieldrin Pesticides

Other Names: 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonapth[2,3-b]oxirene; 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,exo-1,4:5,8-dimethanonphthalene; Compound 497; Insecticide no. 497; HEOD; ENT 16225; Octalox
Haz Waste #: P037 Ind/EPA Gen #:
Formula: C12H8Cl6O
Description: A stereoisomer of endrin (P051); crystals; readily absorbed through skin; manufacture and use has been discontinued in the U.S. (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	380.93	2
Melting point (C):	176.00 to 177.00	2
Vapor pressure (torr, 25C):	(20 C) 0.17800E-06	3
Henry's law'const (atm m**3/mol, 25C):	0.58000E-04	3
Solubility in water (mg/L, 25C):	0.2000	3
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolysis slow	3
Biodegradation rate in water (1/month):	Bioaccumulation moderate	3

August 1987 HALOGENATED PESTICIDES
CAS #: 115-29-7 alpha-Endosulfan Pesticides

Other Names: 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepin 3-oxide; Malix; Thiodan; 1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dimethanol cyclic sulfite; 1,2,3,4,7,7-Hexachlorobicyclo[2,2,1]-2-heptene-5,6-bisoxymethylene sulfite; Chlorthiepin; Thionex
Haz Waste #: P050 Ind/EPA Gen #:
Formula: C9H6Cl6O3S
Description: Brown crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	406.95	2
Melting point (C):	106.00	2
Vapor pressure (torr, 25C):	0.10000E-04	3
Solubility in water (mg/L, 25C):	0.5300	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.55	3
Partition coefficient, soil/water:	269.00	17
Hydrolysis rate, water (1/month, 25C):	Hydrolysis may be important	3
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED PESTICIDES
CAS #: 72-20-8 Endrin Pesticides

Other Names: 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-2,7:3,6-dimethanonaphth[2,3-b]oxirene; Mendrin; Nendrin; 1,2,3,4,10,10-Hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-endo,endo-1,4:5,8-dimethanonaphthalene; Hexadrin; Compound 269; Experimental insecticide no. 269; ENT 17251
Haz Waste #: P051 Ind/EPA Gen #: D012
Formula: C12H8Cl6O
Description: Crystals; toxic to fish; manufacture and use has been discontinued in the U.S. (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	380.93	2
Melting point (C):	Decomposes 245 (235, Ref. 3)	2
Vapor pressure (torr, 25C):	0.20000E-06	3
Henry's law const (atm m**3/mol, 25C):	0.50000E-06	3
Solubility in water (mg/L, 25C):	0.2600	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	5.60	3
Partition coefficient, soil/water:	0.19204E+05	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Bioaccumulation important	3

August 1987 HALOGENATED PESTICIDES
CAS #: 640-19-7 Fluoroacetamide pesticides

Other Names: 2-Fluoroacetamide; Fluoroacetic acid amide; 1081; Fussol; Monofluroracetamide; Fluorakil 100
Haz Waste #: P057 Ind/EPA Gen #:
Formula: CH2FCONH2
Description: Crystals; sublimes on heating

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	77.06	2
Solubility in water (mg/L, 25C):	Freely soluble	2

August 1987 HALOGENATED PESTICIDES
CAS #: 62-74-8 Na Fluoracetic acid pesticides

Other Names: Fluoroacetic acid, sodium salt; Compound 1080; 1080; Fratol
Haz Waste #: P058 Ind/EPA Gen #:
Formula: CH2FCOONa; C2FH2NaO2
Description: Fine white powder; extremely toxic

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	100.02	17
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 HALOGENATED PESTICIDES
CAS #: 76-44-8 Heptachlor Pesticides

Other Names: 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indane; Velsicol 104; Drimox; Drinox; Heptamul; 1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene; E3314
Haz Waste #: P059 Ind/EPA Gen #:
Formula: C10H5Cl7
Description: Crystals; the EPA has cancelled registration of pesticides containing this compound with the exception its use through subsurface ground insertion for termite control and the dipping of roots or tops of non-food plants (FR vol. 40, p. 28850, 7/9/75); poisoning may occur by ingestion, inhalation, skin contamination; stimulates CNS (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	373.35	2
Melting point (C):	95.00 to 96.00	2
Vapor pressure (torr, 25C):	0.30000E-03	3
Henry's law const (atm m**3/mol, 25C):	0.14800E-02	3
Solubility in water (mg/L, 25C):	0.0560 to 0.1800	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	4.40	3
Partition coefficient, soil/water:	1580.00	17
Hydrolysis rate, water (1/month, 25C):	Hydrolysis rapid	3
Biodegradation rate in water (1/month):	Will bioaccumulate	3

August 1987 HALOGENATED PESTICIDES
CAS #: 465-73-6 Isodrin pesticides

Other Names: Compound 711
Haz Waste #: P060 Ind/EPA Gen #:
Formula: C12H8Cl6
Description: endo,endo-isomer of Aldrin (P004); cyrstals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	364.93	2
Melting point (C):	240.00 to 242.00	2

August 1987 HALOGENATED PESTICIDES
CAS #: 8001-35-2 Toxaphene Pesticides

Other Names: Camphene polychlorinates (67-69% Cl); Alltox; Geniphene; Motox; Penphene; Toxakil; Camphechlor; Synthetic 3956; Chlorinated camphene; Polychlorocamphene; Phenacide; Phenatox; Strobane-T; Alltex; Anatox; Camphochlor; Camphoclor; Chem-phene; Chlorocamphene; Compound 3956; Crestoxo; Cristoxo; Clor chem T-590; ENT 9735; Estonox; Fasco-terpene; Gy-phene; Hercules toxaphene; Hercules 3956; Kamfochlor; M 5055; Melipax; NCI-C00259; PCHK; Phenacide; Octachlorocamphene; Polychlorcamphene; Phenatox; Toxadust; Toxakil; Toxon 63; Toxyphen; Vertac 90%; (others)
Haz Waste #: P123 Ind/EPA Gen #: D015,K041,K098
Formula: ca. C10H10Cl8 (C10H8Cl10, C10H(18-n)Cln, C10H(16-n)Cln)
Description: Yellow, waxy solid; pleasant piney odor. A very complex, but reproducible mixture of at least 177 C10 polychloro derivatives. Can cause mild irritation of, and be absorbed through, skin. CNS stimulant. Listed as a carginogen by the EPA. (Ref. 2); available as a wettable powder, emulsifiable concentrate, dust, granule, bait, oil and emulsion; can be extremely persistent in soil receiving direct application (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	(average) 414.00	3
Melting point (C):	65.00 to 90.00	2
Boiling point (C):	Decomposes >120	3
Vapor pressure (torr, 25C):	0.2000 to 0.4000	3
Henry's law const (atm m**3/mol, 25C):	0.48900E-02	3
Solubility in water (mg/L, 25C):	0.5000 to 3.0000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.30	3
Partition coefficient, soil/water:	160.00	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Biodegrades and bioaccumulates	3

August 1987 HALOGENATED PESTICIDES
CAS #: 5103-71-9 Chlordane Pesticides

Other Names: 1,2,4,5,6,7,8,8-Octachloro-3a,4,7,7a-tetrahydro-4,7-methano-indane; trans-Chlordane
Haz Waste #: U036 Ind/EPA Gen #: K032,K033,K034,K097
Formula: C10H4Cl8

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	406.00	3
Melting point (C):	103.00 to 105.00	3
Boiling point (C):	(at 2 torr) 175.00	3
Vapor pressure (torr, 25C):	0.10000E-04	3
Henry's law const (atm m**3/mol, 25C):	0.48000E-04	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.78	3
Partition coefficient, soil/water:	54.2000	17
Biodegradation rate in water (1/month):	Bioaccumulation important	3

August 1987 HALOGENATED PESTICIDES
CAS #: 510-15-6 Chlorobenzilate pesticides

Other Names: Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy, ethyl ester
Haz Waste #: U038 Ind/EPA Gen #:
Formula: (C6H4Cl)2C(OH)(COOC2H5)
Description: Viscous liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	325.20	2
Melting point (C):	(0.04) 146.00 to 148.00	2
Vapor pressure (torr, 25C):	(mmHg, 20C) 0.22000E-05	2
Solubility in water (mg/L, 25C):	Slightly	2

August 1987 HALOGENATED PESTICIDES
CAS #: 59-50-7 p-Chloro-m-cresol pesticides

Other Names: 4-Chloro-m-cresol; 4-Chloro-3-methylphenol; Chlorocresol; 3-Methyl-4-chlorophenol; Parachlorometacresol; 6-Chloro-m-cresol; 6-Chloro-3-hydroxytoluene; 2-Chloro-5-hydroxytoluene
Haz Waste #: U039 Ind/EPA Gen #:
Formula: C7H7ClO
Description: Dimorphous crystals; usually a phenolic odor; aqueous solution turns yellow on exposure to light and air (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	142.58	2
Melting point (C):	55.5 and 66. (ligroin crystals)	2
Boiling point (C):	235.00	2
Solubility in water (mg/L, 25C):	(20 C) 3850.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.95	3
Partition coefficient, soil/water:	77.2000	17
Biodegradation rate in water (1/month):	Readily biodegraded	3

August 1987 HALOGENATED PESTICIDES
CAS #: 95-57-8 2-Chlorophenol Pesticides

Other Names: o-Chlorophenol
Haz Waste #: U048 Ind/EPA Gen #:
Formula: C6H5OCl
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	128.60	3
Melting point (C):	9.30	2
Boiling point (C):	175.00	2
Density (g/cc, 20C):	1.2573	2
Vapor pressure (torr, 25C):	(20 C) 2.2000	3
Henry's law const (atm m**3/mol, 25C):	0.82800E-05	3
Solubility in water (mg/L, 25C):	(20 C) 0.28500E+05	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.17	3
Biodegradation rate in water (1/month):	Significant biodegradation	3

August 1987 HALOGENATED PESTICIDES
CAS #: 72-54-8 4,4'-DDD Pesticides

Other Names: 1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane; TDE; DDD; 1,1'-(2,2-Dichloroethylidene)bis[4-chlorobenzene]; p,p'-DDD; Tetrachlorodiphenylethane; p,p'-TDE; Rhothane; Dichlorodiphenyldichloroethane
Haz Waste #: U060 Ind/EPA Gen #:
Formula: C14H10Cl4
Description: Crystals; slightly irritating to skin; symptoms similar to DDT (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	320.05	2
Melting point (C):	109.00 to 110.00	2
Vapor pressure (torr, 25C):	(30 C) 0.10200E-05	3
Henry's law const (atm m**3/mol, 25C):	0.21600E-04	3
Solubility in water (mg/L, 25C):	0.0200 to 0.0900	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	5.99	3
Biodegradation rate in water (1/month):	Important biotransformation	3

August 1987 HALOGENATED PESTICIDES
CAS #: 789-02-6 4,4'-DDT Pesticides

Other Names: p,p'-DDT
Haz Waste #: U061 Ind/EPA Gen #:
Formula: C14H9Cl5

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	354.50	2
Melting point (C):	108.50 to 109.00	2
Boiling point (C):	185.00	3
Vapor pressure (torr, 25C):	(20 C) 0.19000E-06	3
Solubility in water (mg/L, 25C):	<1.5 to 5.5	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.98	3
Hydrolysis rate, water (1/month, 25C):	Hydrolysis may be important	3
Biodegradation rate in water (1/month):		
Both biotransformation and bioaccumulation are important		3

August 1987 HALOGENATED PESTICIDES
CAS #: 2303-16-4 Diallate pesticides

Other Names: Carbamothioic acid bis(1-methylethyl)-S-(2,3-dichloro-2-propenyl) ester
Haz Waste #: U062 Ind/EPA Gen #:
Formula: ((CH3)2CH)2NCOSCH2CCl=CHCl
Description: Brown liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	270.24	2
Boiling point (C):	(9) 150.00	2
Solubility in water (mg/L, 25C):	(ppm) 40.0000	2

August 1987 HALOGENATED PESTICIDES
CAS #: 96-12-8 1,2-Dibromo-3-chloropropane pesticides

Other Names: BBC 12; 3-Chloro-1,2-dibromopropane; DBCP; Fumagon; 1-Chloro-2,3-dibromopropane; Dibromochloropropane; Fumazone; NCI-C00500; Nemabrom; Nemafume; Nemagon; Nemanax; Nemapaz; Nemaset; Nematocide; Nematox; Nemazon; OS 1897; Oxy DBCP; SD 1897
Haz Waste #: U066 Ind/EPA Gen #:
Formula: C3H5Br2Cl
Description: Dark amber to dark brown liquid; moderately volatile and degraded in moist soil; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	236.36	2
Boiling point (C):	196.00	2
Density (g/cc, 20C):	2.0930	2
Vapor pressure (torr, 25C):	(mmHg, 21 C) 0.8000	2
Solubility in water (mg/L, 25C):	Slightly	2

August 1987 HALOGENATED PESTICIDES
CAS #: 106-46-7 1,4-Dichlorobenzene

Other Names: p-Dichlorobenzene; Paracide; PDB; Para-zene; Di-chloricide; Paramoth
Haz Waste #: U072 Ind/EPA Gen #: K085,K105
Formula: 1,4-C6H4Cl2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	147.00	1
Melting point (C):	53.04	1
Boiling point (C):	174.10	1
Density (g/cc, 20C):	(liquid) 1.2475	1
Vapor pressure (torr, 25C):	1.1800	3
Henry's law const (atm m**3/mol, 25C):	0.28800E-02	3
Solubility in water (mg/L, 25C):	79.0000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.39	3
Partition coefficient, soil/water:	193.00	17
Biodegradation rate in water (1/month):	Bioaccumulates	3

August 1987 HALOGENATED PESTICIDES
CAS #: 120-83-2 2,4-Dichlorophenol Pesticides

Other Names: 2,4-DCP
Haz Waste #: U081 Ind/EPA Gen #:
Formula: C6H4Cl2O

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	163.00	3
Melting point (C):	45.00	3
Boiling point (C):	210.00	3
Vapor pressure (torr, 25C):	0.1200	3
Henry's law'const (atm m**3/mol, 25C):	0.66600E-05	3
Solubility in water (mg/L, 25C):	4500.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.75	3
Hydrolysis rate, water (1/month, 25C):	Hydrolysis not important	3
Biodegradation rate in water (1/month):	Rapid biodegradation	3

August 1987 HALOGENATED PESTICIDES
CAS #: 87-65-0 2,6-Dichlorophenol pesticides

Haz Waste #: U082 Ind/EPA Gen #: K043
Formula: C6H4Cl2O
Description: Needles

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	163.00	13
Melting point (C):	66.00 to 67.00	13
Boiling point (C):	219.00 to 220.00	13

August 1987 HALOGENATED PESTICIDES
CAS #: 79-44-7 Dimethylcarbamoyl chloride pesticides

Other Names: N,N-Dimethylcarbamyl chloride; DDC; DMCC; TL 389; Chloroformic acid dimethylamide; (Dimethylamino)carbonyl chloride; Dimethylcarbamic acid chloride; Dimethylcarbamic chloride; N,N-Dimethylcarbamidoyl chloride
Haz Waste #: U097 Ind/EPA Gen #:
Formula: C3H6ClNO
Description: Colorless liquid; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	107.54	17
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolyzes rapidly	12

August 1987 HALOGENATED PESTICIDES
CAS #: 118-74-1 Hexachlorobenzene

Other Names: Perchlorobenzene; Anticarie; Bunt-cure; Bunt-no-more; Julin's carbon chloride (Ref. 2)
Haz Waste #: U127 Ind/EPA Gen #:
Formula: C6Cl6

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		284.80	2
Melting point (C):		228.70	1
Boiling point (C):		319.30	1
Density (g/cc, 20C):	(kg/L, liquid)	1.5960	1
Vapor pressure (torr, 25C):	(kPa)	0.34400E-03	3
Henry's law const (atm m**3/mol, 25C):	(kPa m**3/mol, 20 C)	0.50000E-02	3
Solubility in water (mg/L, 25C):	(g/m**3)	0.50000E-02	3

August 1987 HALOGENATED PESTICIDES
CAS #: 87-68-3 Hexachlorobutadiene Pesticides

Other Names: HCBD
Haz Waste #: U128 Ind/EPA Gen #:
Formula: CCl2=CCl-CCl-CCl2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	260.80	3
Melting point (C):	-21.00	3
Boiling point (C):	215.00	3
Vapor pressure (torr, 25C):	0.1500	3
Henry's law const (atm m**3/mol, 25C):	0.0103	3
Solubility in water (mg/L, 25C):	2.0000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.74	3
Partition coefficient, soil/water:	400.00	17

August 1987 HALOGENATED PESTICIDES
CAS #: 58-89-9 Lindane pesticides

Other Names: 1,2,3,4,5,6-Hexachlorocyclohexane; gamma-HCH; gamma-Benzene hexachloride; gamma Hexachlor; ENT 7796; Aparsin; Aphtiria; gamma-BHC; Gammalin; Gamene; Gamiso; Gammexane; Gexane; Jacutin; Kwell; Lindafor; Lindatox; Lorexane; Quellada; Streunex; Tri-6; Viton; Aalindan; Aficide; Agrisol G-20; Agrocide; Agronexit; Ameisenatod; Ben-hex; Bentox 10; Celanex; Detmol-extrakt; Detox 25; Hortex; Isotox; Forlin; Lindagam; Lindagrain; gamma-Lindane; Lindex; Omnitox; Tap 85; Nexol-E; Nexit; Linvur; Gamacid; Gamaphex; Gammahexa; Gammahexane; Gammalin; (many others)
Haz Waste #: U129 Ind/EPA Gen #: D013
Formula: C6H6Cl6
Description: Slightly musty odor; crystals; poisoning may occur by ingestion, inhalation or percutaneous absorption; this and its isomers (alpha-HCH, beta-HCH and technical HCH) have been listed as carcinogens by the EPA (Ref.2); crystals are colorless; CAS numbers for isomers: alpha--319-84-6, beta--319-85-7, technical--608-73-1 (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	290.85	2
Melting point (C):	112.50	2
Vapor pressure (torr, 25C):	(mmHg, 20 C) 0.94000E-05	2
Solubility in water (mg/L, 25C):	7.8000	9
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.72	16
Partition coefficient, soil/water:	348.00	17

August 1987 HALOGENATED PESTICIDES
CAS #: 77-47-4 Hexachlorocyclopentadiene Pesticides

Other Names: HCCPD; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene
Haz Waste #: U130 Ind/EPA Gen #: K034
Formula: C5Cl6

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	272.80	3
Melting point (C):	-9.90	3
Boiling point (C):	239.00	3
Vapor pressure (torr, 25C):	0.0810	3
Henry's law!const (atm m**3/mol, 25C):	0.0164	3
Solubility in water (mg/L, 25C):	1.8000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	3.99	3
Hydrolysis rate, water (1/month, 25C):	Hydrolysis could occur	3
Biodegradation rate in water (1/month):	Bioaccumulated	3

August 1987 HALOGENATED PESTICIDES
CAS #: 70-30-4 Hexachlorophene pesticides

Other Names: 2,2'-Methylenebis[3,4,6-trichlorophenol]; G-11; AT-7; 2,2'-Dihydroxy-3,3',5,5',6,6'-hexachlorodiphenylmethane; Bis(3,5,6-trichloro-2-hydroxyphenyl)methane; Bilevon; Dermadex; Exofene; Gamophen; Hexosan; pHisohex; Surgi-Cen; Surofene
Haz Waste #: U132 Ind/EPA Gen #:
Formula: (C6HCl3OH)2CH2; C13H6Cl6O2
Description: Crystals; forms salts with alkalies and alkaline earths; excessive dosage to animals results in symptoms of neurotoxicity; use regulated by FDA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	406.92	2
Melting point (C):	164.00 to 165.00	2
Solubility in water (mg/L, 25C):	Almost insoluble	2

August 1987 HALOGENATED PESTICIDES
CAS #: 143-50-0 Kepone Pesticides

Other Names: Chlordecone; Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta[cd]pentalen-2-one; GC-1189; CIBA 8514; Clordecone; Compound 1189; Decano-4-one; Decachloro-1,3,4-metheno-2H-cyclobuta(cd)pentalen-2-one; Decachloroketone; ENT-16391; 1,1a,3,3a,4,5,5a,5b,6-Decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(cd)pentalen-2-one; General Chemicals 1189; Decachlorotetracyclodecanone; Merex; NCI-C00191; Decachlorooctahydrokepone-2-one
Haz Waste #: U142 Ind/EPA Gen #:
Formula: C10Cl10O
Description: Crystals; has caused tumors in factory workers exposed to this substance; listed as a carcinogen by the EPA (Ref. 2) no longer manufactured or used in the U.S. (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	490.68	2
Boiling point (C):	Sublimes at 350 C	3
Solubility in water (mg/L, 25C):	(100 C) 4000.00	3

August 1987 HALOGENATED PESTICIDES
CAS #: 82-68-8 Pentachloronitrobenzene pesticides

Other Names: Quintozene; PCNB; Terrachlor; PKhNB; Avicol; Botrilex; Brassicol; Folosan; Terraclor; Tilcarex; Tritisan
Haz Waste #: U185 Ind/EPA Gen #:
Formula: C6Cl5NO2
Description: Fine needles, platelets

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		295.36	2
Melting point (C):		144.00	2
Boiling point (C):	(some decomposition)	328.00	2
Density (g/cc, 20C):	(25 C)	1.7180	2
Solubility in water (mg/L, 25C):	Practically insoluble		2

August 1987 HALOGENATED PESTICIDES
CAS #: 58-90-2 2,3,4,6-Tetrachlorophenol pesticides

Haz Waste #: U212 Ind/EPA Gen #:
Formula: C6H2Cl4O
Description: Needles; highly toxic orally (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		232.00	13
Melting point (C):		70.00	13
Boiling point (C):	(15 mm Hg)	150.00	13

August 1987 HALOGENATED PESTICIDES
CAS #: 95-95-4 2,4,5-Trichlorophenol pesticides

Other Names: Collunosol
Haz Waste #: U230 Ind/EPA Gen #:
Formula: C6H3Cl3O

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		197.46	1
Melting point (C):	(sublimes)	67.00	1
Boiling point (C):		253.00	1

August 1987 HALOGENATED PESTICIDES
CAS #: 88-06-2 2,4,6-Trichlorophenol Pesticides

Other Names: Dowicide 2S; Omal
Haz Waste #: U231 Ind/EPA Gen #:
Formula: C6H3Cl3O
Description: Crystals; strong phenolic odor; volatile with steam; forms a sodium salt (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	197.46	2
Melting point (C):	69.00	2
Boiling point (C):	246.00	2
Density (g/cc, 20C):	1.4901	2
Vapor pressure (torr, 25C):	1.0000	3
Henry's law const (atm m**3/mol, 25C):	0.72000E-05	3
Solubility in water (mg/L, 25C):	800.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	3.38	3
Partition coefficient, soil/water:	189.00	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED PESTICIDES
CAS #: 93-76-5 2,4,5-Trichlorophenoxy acetic acid pest.

Other Names: 2,4,5-T; 2-(2,4,5-Trichlorophenoxy)propionic acid; Fenoprop; 2,4,5-TC; Miller Nu Set (Hormone Spray)
Haz Waste #: U232 Ind/EPA Gen #: K042
Formula: C8H5Cl3O3
Description: Crystals; irritating to eyes, skin, mucous membranes (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		255.49	1
Melting point (C):		153.00	1
Density (g/cc, 20C):		1.8000	1
Solubility in water (mg/L, 25C):	(mg/kg, 30 C)	238.00	1

August 1987 HALOGENATED PESTICIDES
CAS #: 93-72-1 Silvex pesticides

Other Names: 2-(2,4,5-Trichlorophenoxy)propionic acid; 2,4,5-TC
Haz Waste #: U233 Ind/EPA Gen #: D017
Formula: C9H7Cl3O3

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		269.53	1
Melting point (C):		181.60	1
Solubility in water (mg/L, 25C):	(%)	0.0140	1

August 1987 HALOGENATED PESTICIDES
CAS #: 87-86-5 Pentachlorophenol Pesticides

Other Names: Penta; PCP; Penchlorol; Santophen 20
Haz Waste #: U242 Ind/EPA Gen #: K001
Formula: C6HCl5O; C6Cl5OH
Description: Needle-like crystals; very pungent odor when hot; sublimes in needles; forms a sodium salt; ingestion causes increase then decrease in respiration, blood pressure, urinary output, etc. leading to death; Causes lung, liver, kidney damage; contact dermatitis; may be absorbed through skin (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		266.35	2
Melting point (C):	190.00 to	191.00	2
Boiling point (C):	309.00 to	310.00	2
Density (g/cc, 20C):		1.9780	2
Vapor pressure (torr, 25C):	(20 C)	0.11000E-03	3
Henry's law const (atm m**3/mol, 25C):		0.88200E-05	3
Solubility in water (mg/L, 25C):		14.0000	3
RETENTION PROPERTIES:			Ref.
log (octanol/water) partition (25C):		5.01	3
Partition coefficient, soil/water:		5624.00	17
Biodegradation rate in water (1/month):		Significant	3

August 1987 HALOGENATED PESTICIDES
CAS #: 1888-71-7 Hexachloropropene pesticides

Other Names: 1,1,2,3,3,3-Hexachloro-1-propene; Hexachloropropylene
Haz Waste #: U243 Ind/EPA Gen #:
Formula: Cl2C=CClCCl3; C3Cl6
Description: Highly toxic by inhalation; irritant (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		249.00	13
Boiling point (C):	209.00 to	210.00	13
Density (g/cc, 20C):		1.7600	13

August 1987 HALOGENATED PESTICIDES
CAS #: 72-43-5 Methoxychlor

Other Names: 1,1'-(2,2,2-Trichlorethylidene)-bis[4-methyoxybenzene]; 1,1,1-Trichloro-2,2-bis(p-methoxypehnyl)ethane; Marlate; 2,2-Di-p-anisyl-1,1,1-trichloroethane; DMDT; Methoxy-DDT
Haz Waste #: U247 Ind/EPA Gen #: D014
Formula: C16H15Cl3O2
Description: Dimorphic crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	345.65	2
Melting point (C):	78. to 78.2 or 86. to 88. (dimorphic)	2
Solubility in water (mg/L, 25C):	Practically insoluble	2

7.4 Polynuclear Aromatics

August 1987 POLYNUCLEAR AROMATICS
CAS #: 53-96-3 2-Acetylaminofluorene

Other Names: N-2-Fluorenylacetamide; N-9H-Fluoren-2-ylacet-amide; AAF; 2-FAA; 2-AAF; 2-Acetamidofluorene; 2-Acetaminofluorene; N-Acetyl-2-aminofluorene; 2-(Acetylamino)fluorene; FAA; N-Fluoren-2-ylacetamide; 2-Fluorenylacetamide
Haz Waste #: U005 Ind/EPA Gen #:
Formula: C15H13NO
Description: Crystals; listed as a carcinogen by the EPA

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	223.26	2
Melting point (C):	194.00	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 POLYNUCLEAR AROMATICS
CAS #: 225-51-4 Benz(c)acridine

Other Names: 1,2-Benzacridine; alpha-Chrysidine; alpha-Naphthacridine; alpha-Phenonaphthacridine; 2,1-Naphthacridine
Haz Waste #: U016 Ind/EPA Gen #:
Formula: C17H11N
Description: Air pollutant; brilliant yellow needles; experimental carcinogen (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	229.00	13
Melting point (C):	108.00	13

August 1987 POLYNUCLEAR AROMATICS
CAS #: 56-55-3 Benz[a]anthracene

Other Names: 1,2-Benzanthracene; 2,3-Benzphenanthrene; Tetraphene; BA; Benzanthrene; Naphthanthracene; 1,2-Benz(a)anthracene; Benzanthracene; 1,2-Benzanthrene; Benzo(a)anthracene; Benzo(a)pehnanthrene; Benzo(b)pehnanthrene; Benzoanthracene; 1,2-Benzoanthracene; 2,3-Benzopehnanthrene
Haz Waste #: U018 Ind/EPA Gen #:
Formula: C18H12
Description: Plates; greenish-yellow fluorescence; listed as a carcinogen by the EPA (Ref. 2); no reported commercial use or application (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	228.30	3
Melting point (C):	155.00 to 157.00	3
Boiling point (C):	Sublimes	3
Vapor pressure (torr, 25C):	0.50000E-08	3
Solubility in water (mg/L, 25C):	0.0140	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	5.61	3
Partition coefficient, soil/water:	0.19608E+05	17
Biodegradation rate in water (1/month):	Slow	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 50-32-8 Benzo[a]pyrene

Other Names: 3,4-Benzpyrene; (formerly 1,2-Benzpyrene); B(a)P; BP; Benz(a)pyrene; 3,4-Benz(a)pyrene; Benzo(d,e,f)chrysene; 6,7-Benzopyrene; 3,4-Benzypyrene; 3,4-BP
Haz Waste #: U022 Ind/EPA Gen #:
Formula: C20H12
Description: Yellowish plates; crystals may be monoclinic or orthorhombic; listed as a carcinogen by the EPA (Ref. 2) combustion byproduct; a constituent of creosote (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	252.30	3
Melting point (C):	179.00	3
Boiling point (C):	310.00 to 312.00	3
Vapor pressure (torr, 25C):	0.50000E-08	3
Henry's law const (atm m**3/mol, 25C):	0.0126	3
Solubility in water (mg/L, 25C):	0.38000E-02	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	6.04	3
Biodegradation rate in water (1/month):	Biodegraded	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 218-01-9 Chrysene

Other Names: Benzo(a)phenanthrene
Haz Waste #: U050 Ind/EPA Gen #:
Formula: C18H12

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	228.30	3
Melting point (C):	256.00	3
Boiling point (C):	448.00	3
Vapor pressure (torr, 25C):	0.10000E-10 to 0.10000E-05	3
Solubility in water (mg/L, 25C):	0.20000E-02	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	5.61	3
Partition coefficient, soil/water:	0.19600E+05	17
Biodegradation rate in water (1/month):	Bioaccumulated	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 53-70-3 Dibenz[a,h]anthracene

Other Names: 1,2:5,6-Dibenzanthracene; DB(a,h)A; 1,2,5,6-DBA; 1,2:5,6-Benzanthracene; Dibenzo(a,h)anthracene
Haz Waste #: U063 Ind/EPA Gen #:
Formula: C22H14
Description: Plates, leaflets; crystals may be monoclinic or orthorhombic; listed as a carcinogen by the EPA (Ref. 2); no reported commercial application; a product of incomplete combustion (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	278.40	3
Melting point (C):	270.00	3
Boiling point (C):	Sublimes	3
Vapor pressure (torr, 25C):	(approx.) 0.10000E-09	3
Solubility in water (mg/L, 25C):	0.50000E-02	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	5.93	3
Biodegradation rate in water (1/month):	Degraded slowly	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 189-55-9 Dibenzo(a,i)pyrene

Other Names: DB(a,i)P; 1,2,7,8-Dibenzopyrene; Debenz(a,i)pyrene; 3,4:9,10-Dibenzopyrene; 3,4:9,10-Dibenzpyrene Benzo[rst]pentaphene
Haz Waste #: U064 Ind/EPA Gen #:
Formula: C24H14
Description: Not commercially produced, but found as a combustion product; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	302.37	17
Solubility in water (mg/L, 25C):	Insoluble	12

August 1987 POLYNUCLEAR AROMATICS
CAS #: 57-97-6 7,12-Dimethylbenz[a]anthracene

Other Names: 9,10-Dimethyl-1,2-benzanthracene; 1,4-Dimethyl-2,3-benzphenanthrene
Haz Waste #: U094 Ind/EPA Gen #:
Formula: C20H16
Description: Plates, leaflets; faint greenish-yellow tinge

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	256.33	2
Melting point (C):	122.00 to 123.00	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 POLYNUCLEAR AROMATICS
CAS #: 206-44-0 Fluoranthene

Other Names: Benzo(j,k)fluorene
Haz Waste #: U120 Ind/EPA Gen #:
Formula: C16H10

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	202.30	3
Melting point (C):	111.00	3
Boiling point (C):	375.00	3
Vapor pressure (torr, 25C):	0.10000E-05 to 0.10000E-03	3
Solubility in water (mg/L, 25C):	0.2600	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	5.33	3
Partition coefficient, soil/water:	0.11000E+05	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 193-39-5 Indeno (1,2,3-c,d) pyrene

Other Names: 2,3-o-Phenylenepyrene; IP; 1,10-(o-Phenylene)pyrene;
1,10-(1,2-Phenylene)pyrene; o-Phenylenepyrene;
2,3-Phenylenepyrene
Haz Waste #: U137 Ind/EPA Gen #:
Formula: C22H12
Description: A carcinogen; not commercially manufactured; a byproduct of combustion (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	276.30	3
Melting point (C):	162.00 to 164.00	3
Vapor pressure (torr, 25C):	(approx.) 0.10000E-09	3
Solubility in water (mg/L, 25C):	0.6200	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	7.66	3
Biodegradation rate in water (1/month):	Slow	3

August 1987 POLYNUCLEAR AROMATICS
CAS #: 56-49-5 3-Methylcholanthrene

Other Names: 1,2-Dihydro-3-methyl-benz[j]aceanthrylene; 3-MECA; 3-MC;
20-Methylcholanthrene
Haz Waste #: U157 Ind/EPA Gen #:
Formula: C21H16
Description: Pale yellow, slender prisms

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	268.34	2
Melting point (C):	179.00 to 180.00	2
Boiling point (C):	(80 mm Hg) 280.00	2
Density (g/cc, 20C):	1.2800	2
Solubility in water (mg/L, 25C):	Insoluble	2

CAS #: 91-20-3 Naphthalene

Other Names: Naphthene; Naphthalin; Tar camphor
Haz Waste #: U165 Ind/EPA Gen #: K023,K024
Formula: C10H8
Description: Monoclinic prismatic plates; also sold as white scales, powder, balls or cakes; odor of moth balls; volatilizes appreciably at room temperature; sublimes appreciably at temperatures above melting point; poisoning may occur by ingestion of large doses, inhalation or skin absorption; symptoms range from nausea and vomiting to convulsions and coma (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	128.20	3
Melting point (C):	80.60	3
Boiling point (C):	(sublimes) 218.00	3
Vapor pressure (torr, 25C):	0.0492	3
Henry's law const (atm m**3/mol, 25C):	0.36000E-03	3
Solubility in water (mg/L, 25C):	34.4000	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	3.37	3
Partition coefficient, soil/water:	185.00	17
Biodegradation rate in water (1/month):	Rapid	3

7.5 Oxygenated

August 1987 OXYGENATED
CAS #: 460-19-5 Cyanogen

Other Names: Ethanedinitrile; Dicyan; Oxalic acid dinitrile
Haz Waste #: P031 Ind/EPA Gen #:
Formula: C2N2
Description: Highly poisonous gas; almond-like odor; toxic effects similar to those of hydrogen cyanide (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		52.04	2
Melting point (C):		-27.90	2
Boiling point (C):		-21.17	2
Density (g/cc, 20C):	(-21.17 C)	0.9537	2
Solubility in water (mg/L, 25C):	4 vols of gas in 1 vol of water		2

August 1987 OXYGENATED
CAS #: 506-77-4 Cyanogen chloride

Haz Waste #: P033 Ind/EPA Gen #:
Formula: CNCl
Description: Liquid; vapors are highly irritant and very poisonous; toxic effects similar to those of hydrogen cyanide (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		61.48	2
Melting point (C):	(solidifies)	-6.00	2
Boiling point (C):		13.80	2
Density (g/cc, 20C):		1.1860	2
Solubility in water (mg/L, 25C):		Soluble	2

August 1987 OXYGENATED
CAS #: 624-83-9 Isocyanic acid methyl ester

Other Names: Methyl isocyanate; Isocyanatomethane
Haz Waste #: P064 Ind/EPA Gen #:
Formula: CH3NCO; C2H3NO
Description: Liquid with powerful odor; highly toxic by inhalation and absorption; lacrimator; extremely flammable (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		57.00	13
Boiling point (C):	43.00 to	45.00	13
Density (g/cc, 20C):		0.9600	13

August 1987 OXYGENATED
CAS #: 107-12-0 Propanenitrile

Other Names: Propionitrile; Ethyl cyanide
Haz Waste #: P101 Ind/EPA Gen #:
Formula: CH3CH2CN; C3H5N
Description: Liquid; poisonous when heated to decomposition or on contact with acids; pleasant, ethereal, sweetish odor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	55.08	2
Melting point (C):	-91.80	2
Boiling point (C):	97.20	2
Density (g/cc, 20C):	0.7818	2
Solubility in water (mg/L, 25C):	11.9 g/100 g at 40 C	2

August 1987 OXYGENATED
CAS #: 75-07-0 Acetaldehyde

Other Names: Ethanal; Ethylaldehyde; "Aldehyde"; Acetic aldehyde
Haz Waste #: U001 Ind/EPA Gen #: K009,K010
Formula: CH3CHO; C2H4O
Description: Flammable liquid; characteristic, pungent odor; general narcotic action; large doses may cause death by respiratory paralysis; symptoms of chronic intoxication resemble those of chronic alcoholism; irritating to mucous membranes (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	44.05	3
Melting point (C):	-124.00	3
Boiling point (C):	21.00	3
Density (g/cc, 20C):	(16 C) 0.7880	2
Vapor pressure (torr, 25C):	740.00	3
Henry's law const (atm m**3/mol, 25C):	0.32400E-04	3
Solubility in water (mg/L, 25C):	Miscible	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	High	3

August 1987 OXYGENATED
CAS #: 98-86-2 Acetophenone

Other Names: 1-Phenylethanone; Phenyl methyl ketone; Acetylbenzene; Hypnone
Haz Waste #: U004 Ind/EPA Gen #:
Formula: C6H5COCH3; C8H8O
Description: Liquid; forms laminar crystals at low temperatures

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	120.15	2
Melting point (C):	20.50	2
Boiling point (C):	202.00	2
Density (g/cc, 20C):	(15 C) 1.0330	2
Solubility in water (mg/L, 25C):	Slightly soluble	2

August 1987 OXYGENATED
CAS #: 98-82-8 Cumene

Other Names: (1-Methylethyl)benzene; Cumol; Isopropylbenzene
Haz Waste #: U055 Ind/EPA Gen #: K022
Formula: C9H12
Description: Colorless liquid; narcotic in high concentrations (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	120.19	2
Boiling point (C):	152.00 to 153.00	2
Density (g/cc, 20C):	0.8620	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 OXYGENATED
CAS #: 1464-53-5 Diepoxybutane

Other Names: 2,2'-Bioxirane; 1,2:3,4-Diepoxybutane
Haz Waste #: U085 Ind/EPA Gen #:
Formula: C4H6O2
Description: Mutagen; experimental carcinogen (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	86.00	13

August 1987 OXYGENATED
CAS #: 50-00-0 Formaldehyde

Other Names: Methanal; Oxymethylene; Oxomethane; Methylene Oxide; Formic aldehyde; Methyl aldehyde; BFV; Fannoform; Formalin; Formaldehyde solution; Formalith; Formol; Fyde; Hoch; Ivalon; Karsan; NCI-C02799; Oxymethylene
Haz Waste #: U122 Ind/EPA Gen #:
Formula: HCHO; CH2O
Description: Flammable, colorless gas at ordinary temperatures; pungent suffocating odor; very reactive; polymerizes easily; very irritating to mucous membranes; listed as a carcinogen by the EPA (Ref. 2); most frequently marketed as a 37-56 percent aqueous solution stabilized with 10-15 percent methanol to prevent polymerization (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	30.00	3
Melting point (C):	-118.00 to -92.00	3
Boiling point (C):	-21.00 to -19.00	3
Density (g/cc, 20C):	(air=1.00) 1.0670	2
Vapor pressure (torr, 25C):	10.0000	3
Solubility in water (mg/L, 25C):	Very soluble, up to 55%	2
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	High	3

August 1987 OXYGENATED
CAS #: 64-18-6 Formic acid

Other Names: Methanoic acid; Formylic acid
Haz Waste #: U123 Ind/EPA Gen #:
Formula: HCOOH; CH2O2
Description: Colorless liquid; pungent odor; strong reducing agent; dangerously caustic to skin (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	46.03	3
Melting point (C):	8.40	3
Boiling point (C):	100.50	2
Density (g/cc, 20C):	1.2200	2
Vapor pressure (torr, 25C):	40.0000	3
Solubility in water (mg/L, 25C):	Miscible	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	High	3

August 1987 OXYGENATED
CAS #: 765-34-4 Glycidaldehyde

Other Names: Epihydrinaldehyde; 2,3-Epoxy-1-propanal; Glycidal; Epihydrine aldehyde; 2,3-Epoxypropionaldehyde; Oxirane-carboxaldehyde
Haz Waste #: U126 Ind/EPA Gen #:
Formula: C3H4O2
Description: Colorless liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	72.10	14
Boiling point (C):	113.00	14
Density (g/cc, 20C):	1.1403	14

August 1987 OXYGENATED
CAS #: 123-63-7 Paraldehyde

Other Names: Paracetaldehyde
Haz Waste #: U182 Ind/EPA Gen #:
Formula: C6H12O3
Description: Liquid; characteristic aromatic odor; warm, but disagreeable taste; abuse may lead to habituation or addiction (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	132.16	2
Melting point (C):	12.00	2
Boiling point (C):	124.00	2
Density (g/cc, 20C):	(25 C) 0.9940	2
Solubility in water (mg/L, 25C):	Soluble in eight parts water	2

August 1987 OXYGENATED
CAS #: 106-51-4 p-Quinone

Other Names: Quinone; 2,5-Cyclohexadiene-1,4-dione; 1,4-Benzoquinone; 1,4-Cyclohexadienedione
Haz Waste #: U197 Ind/EPA Gen #:
Formula: C6H4O2
Description: Yellow monoclinic prisms; penetrating odor resembling chlorine; irritating vapors; can cause dermatitis; vapors can damage eyes (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	108.09	2
Melting point (C):	(sublimes) 115.70	2
Density (g/cc, 20C):	1.3180	2
Solubility in water (mg/L, 25C):	Slightly soluble	2

August 1987 OXYGENATED
CAS #: 636-21-5 o-Toluidine hydrochloride

Other Names: 2-Amino-1-methylbenzene hydrochloride; NCI-C02335; 1-Amino-2-methylbenzene hydrochloride; o-Aminotoluene hydrochloride; 2-Aminotoluene hydrochloride; 1-Methyl-2-aminobenzene hydrochloride; 2-Methyl-1-aminobenzene hydrochloride; o-Methylaniline hydrochloride; o-Methylaniline hydrochloride; o-Methylbenzenamine hydrochloride; 2-Methylbenzenamine hydrochloride; 2-Toluidine hydrochloride; o-Tolylamine hydrochloride
Haz Waste #: U222 Ind/EPA Gen #:
Formula: C7H9N.HCl
Description: Listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	143.62	17

7.6 Polymerizables

August 1987 POLYMERIZABLE
CAS #: 107-02-8 Acrolein

Other Names: 2-Propenal; Allyl aldehyde; Acrylic aldehyde; Acrylaldehyde; Acraldehyde; Aqualin
Haz Waste #: P003 Ind/EPA Gen #:
Formula: CH2=CH-CHO
Description: Flammable liquid; pungent odor; irritates eyes and mucosa; unstable (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		56.06	2
Melting point (C):		-87.70	3
Boiling point (C):		52.50	3
Density (g/cc, 20C):		0.8389	2
Vapor pressure (torr, 25C):		220.00	3
Henry's law const (atm m**3/mol, 25C):		0.77000E-04	3
Solubility in water (mg/L, 25C):	(?)	0.40000E+06	3
RETENTION PROPERTIES:			Ref.
log (octanol/water) partition (25C):		-0.09	3
Partition coefficient, soil/water:		0.1400	17
Biodegradation rate in water (1/month):		Rapid	3

August 1987 POLYMERIZABLE
CAS #: 107-18-6 Allyl alcohol

Other Names: 2-Propen-1-ol; 1-Propenol-3; Vinyl carbinol
Haz Waste #: P005 Ind/EPA Gen #:
Formula: CH2=CH-CH2OH
Description: Colorless liquid; pungent, mustard-like odor; irritating to the eyes; causes severe irritation of mucous membranes (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		58.08	3
Melting point (C):		-50.00	3
Boiling point (C):	96.00 to	97.00	3
Density (g/cc, 20C):		0.8540	2
Vapor pressure (torr, 25C):		23.8000	3
Henry's law const (atm m**3/mol, 25C):	(15 C)	0.10000E-05	3
Solubility in water (mg/L, 25C):		Miscible	3
RETENTION PROPERTIES:			Ref.
Biodegradation rate in water (1/month):		Degraded	3

August 1987 POLYMERIZABLE
CAS #: 151-56-4 Ethylenimine

Other Names: Aziridine; azacyclopropane; dimethtylenimine
Haz Waste #: P054 Ind/EPA Gen #:
Formula: C2H5N
Description: Liquid; intense odor of ammonia; poisonous; strongly alkaline; strongly irritating to eyes, skin, mucous membranes

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		43.07	2
Boiling point (C):	56.00 to	57.00	2
Density (g/cc, 20C):	(24 C)	0.8321	2
Solubility in water (mg/L, 25C):		Miscible	2

August 1987 POLYMERIZABLE
CAS #: 75-55-8 2-Methylaziridine

Other Names: Propyleneimine
Haz Waste #: P067 Ind/EPA Gen #:
Formula: C3H7N
Description: Fuming oil; highly toxic; suspected human carcinogen; may polymerize explosively in presence of acids (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		57.00	13
Boiling point (C):	66.00 to	67.00	13
Density (g/cc, 20C):	(16 C)	0.8120	13

August 1987 POLYMERIZABLE
CAS #: 75-86-5 2-Methyllactonitrile

Other Names: Acetone cyanohydrin; alpha-Hydroxyisobutyronitrile; USAF RH-8; 2-Hydroxy-2-methyl-propanenitrile
Haz Waste #: P069 Ind/EPA Gen #:
Formula: C4H7NO
Description: Poisonous

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		85.12	14
Melting point (C):		-20.00	14
Boiling point (C):	(23 mm Hg)	82.00	14
Density (g/cc, 20C):	(19 C)	0.9320	14

August 1987 POLYMERIZABLE
CAS #: 107-19-7 Propargyl alcohol

Other Names: 2-Propyn-1-ol
Haz Waste #: P102 Ind/EPA Gen #:
Formula: HC=-CCH2OH; C3H4O
Description: Moderately volatile liquid; mild geranium odor; irritating to skin and mucous membranes (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		56.06	2
Melting point (C):	-52.00 to	-48.00	2
Boiling point (C):	114.00 to	115.00	2
Density (g/cc, 20C):		0.9715	2
Solubility in water (mg/L, 25C):		Miscible	2

August 1987 POLYMERIZABLE
CAS #: 79-06-1 Acrylamide

Other Names: Propenamide
Haz Waste #: U007 Ind/EPA Gen #:
Formula: CH2=CHCONH2; C3H5NO
Description: Monomer--flake-like crystals; highly toxic and irritant; causes CNS paralysis; can be absorbed through unbroken skin (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		71.08	2
Melting point (C):		84.50	2
Boiling point (C):	(25 mm Hg)	125.00	2
Density (g/cc, 20C):	(30 C)	1.1220	2
Solubility in water (mg/L, 25C):			
215.5 g/kg (30 C); polymer--soluble and insoluble forms			2

August 1987 POLYMERIZABLE
CAS #: 79-10-7 Acrylic acid

Other Names: 2-Propenoic acid; Vinylformic acid
Haz Waste #: U008 Ind/EPA Gen #:
Formula: CH2=CHCO2H; C3H4O2
Description: Corrosive liquid; acrid odor and fumes; strong irritant; polymerizes readily in the presence of oxygen (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		72.06	2
Melting point (C):		14.00	2
Boiling point (C):		141.00	2
Density (g/cc, 20C):	(16 C)	1.0621	2
Solubility in water (mg/L, 25C):		Miscible	2

August 1987 POLYMERIZABLE
CAS #: 107-13-1 Acrylonitrile

Other Names: Vinyl cyanamide; Propenonitrile; ABS; Absafil; Absaglas; Abson; Acrylon; B 32; Bakelite; Blendex; Carbacryl; Cevian V; Cyanoethylene; Cycolac; Dow 500; ENT 54; EPA 3530; EPB 3570; Formid; Forsan; Fortylene; Fumigrain; Goodyear 600; Hycar 1441; Kralastic; Kralon; Lacqran; Lastilac; Lustran; Lustropak; Lustrum; Novodur; 2-Propenenitrile; Ravikral; RExene; Ronfalin; Sicoflex; Stylac; Terluran; Tyoylac; VCN; Ventox; Vinyl cyanide; Acritet; (many other commercial names)
Haz Waste #: U009 Ind/EPA Gen #: K011,K013,K014
Formula: CH2=CH-CN; C3H3N
Description: Explosive, flammable, toxic liquid; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	53.06	3
Melting point (C):	-82.00	3
Boiling point (C):	78.50	3
Vapor pressure (torr, 25C):	100.00	3
Henry's law const (atm m**3/mol, 25C):	0.66600E-04	3
Solubility in water (mg/L, 25C):	0.73500E+05	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	-0.14	3
Partition coefficient, soil/water:	0.1200	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 POLYMERIZABLE
CAS #: 123-73-9 Crotonaldehyde

Other Names: 2-Butenal
Haz Waste #: U053 Ind/EPA Gen #:
Formula: CH3CH=CHCHO

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	70.09	3
Melting point (C):	-74.00	3
Boiling point (C):	104.00 to 105.00	3
Henry's law const (atm m**3/mol, 25C):	0.14000E-04	3
Solubility in water (mg/L, 25C):	0.18000E+06	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Rapid	3

August 1987 POLYMERIZABLE
CAS #: 140-88-5 Ethyl acrylate

Other Names: 2-Propenoic acid ethyl ester; Acrylic acid ethyl ester
Haz Waste #: U113 Ind/EPA Gen #:
Formula: CH2=CHCOOCH2CH3; C5H8O2
Description: Monomer--liquid; acrid, penetrating odor retained by clothing; lacrimator; easily polymerized (Ref. 2)
Polymer--transparent, elastic substance; practically no odor; little adhesive power; resists usual solvents (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	100.11	2
Melting point (C):	-72.00	2
Boiling point (C):	99.40	2
Solubility in water (mg/L, 25C):	2 g/100 mL at 20 C	2

August 1987 POLYMERIZABLE
CAS #: 75-21-8 Ethylene oxide

Other Names: Oxirane; Anprolene
Haz Waste #: U115 Ind/EPA Gen #:
Formula: C2H4O
Description: Colorless, flammable gas; explosive; highly irritating to eyes, mucous membranes (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	44.05	2
Melting point (C):	-111.00	2
Boiling point (C):	10.70	2
Density (g/cc, 20C):	0.8694	2
Solubility in water (mg/L, 25C):	Soluble	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	0.40	15

August 1987 POLYMERIZABLE
CAS #: 97-63-2 Ethyl methacrylate

Other Names: Ethylmethyl acrylate; Ethyl-alpha-methyl acrylate; Ethyl-2-methylacrylate; Ethyl-2-methyl-2-propenoate
Haz Waste #: U118 Ind/EPA Gen #:
Formula: C6H10O2
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	114.16	14
Melting point (C):	< -75. C	14
Boiling point (C):	119.00	14
Density (g/cc, 20C):	(25 C) 0.9110	14

August 1987 POLYMERIZABLE
CAS #: 108-31-6 Maleic anhydride

Other Names: 2,5-Furandione; cis-Butenedionic anhydride; Toxilic anhydride
Haz Waste #: U147 Ind/EPA Gen #:
Formula: C4H2O3
Description: Orthorhombic needles; powerful irritant; causes burns; inhalation can cause pulmonary edema; in Malathion (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	98.06	2
Melting point (C):	52.80	2
Boiling point (C):	202.00	2
Density (g/cc, 20C):	1.4800	2
Solubility in water (mg/L, 25C):	Soluble forming maleic acid	2

August 1987 POLYMERIZABLE
CAS #: 109-77-3 Malononitrile

Other Names: Propanedinitrile; Methylene cyanide; Dicyanomethane; Cyanoacetonitrile
Haz Waste #: U149 Ind/EPA Gen #:
Formula: CH2(CN)2; C3H2N2
Description: Colorless solid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	66.06	2
Melting point (C):	32.00	2
Boiling point (C):	218.00 to 219.00	2
Density (g/cc, 20C):	1.1910	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 POLYMERIZABLE
CAS #: 126-98-7 Methacrylonitrile

Other Names: 2-Methyl-2-propenenitrile; Isopropenylnitrile; alpha-Methylacrylonitrile; Isopropene cyanide
Haz Waste #: U152 Ind/EPA Gen #:
Formula: CH2=C(CH3)C-=N; C4H5N
Description: Liquid; lacrimator; inisidious poison; delayed skin reaction (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	67.09	2
Melting point (C):	-35.80	2
Boiling point (C):	90.30	2
Density (g/cc, 20C):	0.8001	2
Solubility in water (mg/L, 25C):	2.57 wt % at 20 C	2

August 1987 POLYMERIZABLE
CAS #: 80-62-6 Methyl methacrylate

Other Names: 2-Methylpropenoic acid methyl ester
Haz Waste #: U162 Ind/EPA Gen #:
Formula: CH2=C(CH3)-COOCH3
Description: Polymerizes easily forming a clear plastic known as Lucite, Plexiglas, Perspex (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		100.10	3
Melting point (C):		-48.00	3
Boiling point (C):	100.00 to	101.00	3
Vapor pressure (torr, 25C):		37.0000	3
Solubility in water (mg/L, 25C):		Slightly	3
RETENTION PROPERTIES:			Ref.
Biodegradation rate in water (1/month):		Rapid	3

August 1987 POLYMERIZABLE
CAS #: 504-60-9 1,3-Pentadiene

Other Names: Piperylene
Haz Waste #: U186 Ind/EPA Gen #:
Formula: H3CCH=CHCH=CH2; C5H8
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	68.00	13
Boiling point (C):	42.00	13

August 1987 POLYMERIZABLE
CAS #: 95-80-7 Toluene diamine

Other Names: Diaminotoluene; 2,4-Diaminotoluene; 5-Amino-o-toluidine; 3-Amino-p-toluidine; Benzofur MT; C.I. Oxidation Base 20; C.I. 76035; Developer B; 2,4-Diamino-1-methylbenzene; 1,3-Diamino-4-methylbenzene; 2,3-Diamino-1-toluene; 2,4-Diaminotoluol; Eucanine GB; Fouramine; Fourrine M; MTD; Nako TMT; NCI-C02302; Pelagol grey J; Fourrine 94; 4-Methyl-1,3-benzenediamine; 4-Methyl-m-phenylenediamine
Haz Waste #: U221 Ind/EPA Gen #:
Formula: C7H10N2
Description: Used in the synthesis of polyurethanes; crystal; used in a 4:1 mixture with 2-6 Diaminotoluene to make Toluene Diisocyanate; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	122.17	17
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 POLYMERIZABLE
CAS #: 584-84-9 Toluene diisocyanate

Other Names: Toluene 2,4-diisocyanate; 2,4-Diisocyanatotoluene; 2,4-tolylene diisocyanate; TDI; Nacconate 100
Haz Waste #: U223 Ind/EPA Gen #: K027
Formula: C9H6N2O2
Description: Liquid; sharp pungent odor; causes skin irritation, allergic eczema, also bronchial asthma (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		174.15	2
Melting point (C):	19.50 to	21.50	2
Boiling point (C):		251.00	2
Density (g/cc, 20C):		1.2244	2
Solubility in water (mg/L, 25C):	Reacts with water with evolution of CO2		2

August 1987 POLYMERIZABLE
CAS #: 51-79-6 Urethane

Other Names: Urethan; Carbamic acid ethyl ester; Ethyl carbamate; Ethyl urethan
Haz Waste #: U238 Ind/EPA Gen #:
Formula: NH2COOC2H5
Description: Crystals; cooling saline taste

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		89.09	2
Melting point (C):	48.00 to	50.00	2
Boiling point (C):	182.00 to	184.00	2
Density (g/cc, 20C):		1.1000	2
Solubility in water (mg/L, 25C):		1 g/0.5 mL	2

7.7 Phenolics

August 1987 PHENOLICS
CAS #: 51-28-5 2,4-Dinitrophenol

Other Names: Aldifen; alpha-Dinitrophenol
Haz Waste #: P048,U104 Ind/EPA Gen #:
Formula: C6H3(NO2)2(OH)
Description: Yellow'orthorhombic crystals; highly toxic; readily absorbed through intact skin; vapors absorbed through respiratory tract (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	184.11	2
Melting point (C):	114.00	3
Boiling point (C):	Sublimes	3
Density (g/cc, 20C):	1.6830	2
Solubility in water (mg/L, 25C):	(18 C) 5600.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.53	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHENOLICS
CAS #: 8001-58-9 Creosote

Other Names: Coal creosote; Brick oil; Coal tar creosote; Coal tar oil; Creosote from coal tar; Creosote oil; Creosotum; Heavy oil; Cresylic creosote; Liquid pitch oil; Naphthalene oil; Tar oil; Wash oil
Haz Waste #: U051 Ind/EPA Gen #:
Formula:
Description: A distillate of coal tar consisting of liquid and solid aromatic hydrocarbons, tar acids and tar bases; translucent brown to black, oily liquid; characteristic sharp odor; (Ref. 2); a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Density (g/cc, 20C):	(38 C, typical value) 1.0600	2
Solubility in water (mg/L, 25C):	Practically insoluble	2

August 1987 PHENOLICS
CAS #: 8021-39-4 Creosote

Other Names: Wood creosote; Beechwood creosote; Creasote; Creosote Beechwood
Haz Waste #: U051 Ind/EPA Gen #:
Formula:
Description: Almost colorless or yellowish, very refractive, oily liquid; characteristic smoky odor; caustic, burning taste; a mixture of phenols obtained from wood tar; large doses may cause GI irritation, cardiovascular collapse, death (Ref. 2); a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Melting point (C):	(does not solidify) -20.00	2
Boiling point (C):	203.00	2
Density (g/cc, 20C):	Not below 1.076 at 25 C	2
Solubility in water (mg/L, 25C):	Soluble in 150-200 parts water	2

August 1987 PHENOLICS
CAS #: 1319-77-3 p-Cresol

Other Names: Hydroxytoluene; Cresylic acid
Haz Waste #: U052,U054 Ind/EPA Gen #: F004
Formula: C6H4CH3(OH)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	108.10	3
Melting point (C):	10.90 to 35.50	3
Boiling point (C):	185.00 to 205.00	3
Vapor pressure (torr, 25C):	1.0000	3
Henry's law const (atm m**3/mol, 25C):	0.14600E-05	3
Solubility in water (mg/L, 25C):	(40 C) 0.24000E+05 to 0.31000E+05	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Rapid	3

August 1987 PHENOLICS
CAS #: 105-67-9 2,4-Dimethylphenol

Other Names: 2,4-Xylenol
Haz Waste #: U101 Ind/EPA Gen #:
Formula: C6H3(CH3)2OH

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	122.20	3
Melting point (C):	24.50	3
Boiling point (C):	211.00	3
Henry's law const (atm m**3/mol, 25C):	0.25200E-05	3
Solubility in water (mg/L, 25C):	(approx.) 1000.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.50	3
Partition coefficient, soil/water:	30.3000	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHENOLICS
CAS #: 100-02-7 4-Nitrophenol

Other Names: p-Nitrophenol
Haz Waste #: U170 Ind/EPA Gen #:
Formula: C6H4(NO2)OH
Description: Colorless to slightly yellow, odorless crystals; sweetish then burning taste (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	139.10	3
Melting point (C):	(sublimes) 115.00	3
Boiling point (C):	(decomposes) 279.00	3
Vapor pressure (torr, 25C):	2.2000	3
Solubility in water (mg/L, 25C):	0.16000E+05	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.91	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHENOLICS
CAS #: 108-95-2 Phenol

Other Names: Carbolic acid
Haz Waste #: U188 Ind/EPA Gen #: K022
Formula: C6H5OH

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	94.11	3
Melting point (C):	40.90	3
Boiling point (C):	182.00	3
Henry's law const (atm m**3/mol, 25C):	0.13000E-06	3
Solubility in water (mg/L, 25C):	0.93000E+05	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.46	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 PHENOLICS
CAS #: 108-46-3 Resorcinol

Other Names: 1,3-Dihydroxybenzene
Haz Waste #: U201 Ind/EPA Gen #:
Formula: C6H4(OH)2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	110.10	3
Melting point (C):	276.00 to 280.00	3
Boiling point (C):	281.00	3
Vapor pressure (torr, 25C):	(138 C) 5.0000	3
Henry's law const (atm m**3/mol, 25C):	0.12200E-09	3
Solubility in water (mg/L, 25C):	(30 C) 0.22900E+07	3
RETENTION PROPERTIES:		**Ref.**
Biodegradation rate in water (1/month):	Rapid	3

7.8 Nonhalogenated Solvents

August 1987 NONHALOGENATED SOLVENTS
CAS #: 75-15-0 Carbon disulfide

Other Names: Carbon bisulfide; Dithiocarbonic anhydride
Haz Waste #: P022 Ind/EPA Gen #: F005
Formula: S=C=S
Description: Highly refractive, mobile, very flammable liquid; poisonous; acute fire and explosion hazard; poisoning may be caused by inhalation, ingestion and skin absorption (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	76.14	3
Melting point (C):	-111.00	3
Boiling point (C):	46.30	3
Density (g/cc, 20C):	(vapor--2.67 (air=1)) 1.2632	2
Vapor pressure (torr, 25C):	360.00	3
Henry's law const (atm m**3/mol, 25C):	0.0133	3
Solubility in water (mg/L, 25C):	(20 C) 2940.00	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 107-15-3 Ethylene diamine

Other Names: 1,2-Ethanediamine
Haz Waste #: P053 Ind/EPA Gen #:
Formula: H2NCH2CH2NH2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	60.11	3
Melting point (C):	8.50	3
Boiling point (C):	116.00	3
Vapor pressure (torr, 25C):	(21 C) 10.0000	3
Solubility in water (mg/L, 25C):	Miscible	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Quantitative	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 57-55-6 Propylene glycol

Other Names: 1,2-Propanediol; Methyl glycol; 1,2-Dihydroxypropane
Haz Waste #: P100 Ind/EPA Gen #:
Formula: CH3CHOHCH2OH; C3H8O2
Description: dl-form--hygroscopic, viscous liquid; slightly acrid taste; tents to oxidize at high temperatures; also l and d forms (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	76.09	2
Melting point (C):	-59.00	2
Boiling point (C):	dl-form--188.2; l form--88.-90. (12 mm Hg); d-form--94-96.	2
Density (g/cc, 20C):	dl-form--1.036; d-form--1.04	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 67-64-1 Acetone

Other Names: 2-Propanone; Dimethyl ketone; beta-Keto-propane; Pyroacetic ether
Haz Waste #: U002 Ind/EPA Gen #: F003,K022
Formula: CH3COCH3; C3H6O
Description: Volatile, highly flammable liquid; pungent, sweetish taste; characteristic odor; serious poisoning rare; keep away from fire and plastics (solvent for plastics) (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	58.08	2
Melting point (C):	-94.00	2
Boiling point (C):	56.50	2
Density (g/cc, 20C):	(25 C) 0.7880	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 75-05-8 Acetonitrile

Other Names: Methyl cyanide; Cyanomethane; Ethanenitrile
Haz Waste #: U003 Ind/EPA Gen #:
Formula: CH3CN; C2H3N
Description: Liquid; ether-like odor; poisonous (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	41.05	2
Melting point (C):	-45.00	2
Boiling point (C):	81.60	2
Density (g/cc, 20C):	(15 C) 0.7875	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 62-53-3 Aniline

Other Names: Aminobenzene; Benzenamine; Aniline oil; Phenylamine; Aminophen; Kyanol
Haz Waste #: U012 Ind/EPA Gen #: K083,K103,K104
Formula: C6H5NH2; C6H7N
Description: Oily liquid; colorless when freshly distilled, darkens on exposure to light or air; poinonous; characteristic odor and burning taste; cumbustible; volatile with steam; intoxication may occur from inhalation, ingestion or cutaneous absorption; many salts (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	93.10	3
Melting point (C):	-6.00	3
Boiling point (C):	184.00	3
Density (g/cc, 20C):	1.0220	2
Vapor pressure (torr, 25C):	0.3000	3
Solubility in water (mg/L, 25C):	0.34000E+05	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Rapid	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 71-43-2 Benzene

Other Names: Cyclohexatriene; Benzol; Benzin; Benzine; Benzole; Phene; Benzolene; Bicarburet of hydrogen; Carbon oil; Pyrob; Coal naphtha; Mineral naphtha; Motor benzol; Pyrobenzol; NCI-C55276; Nitration benzene; Phenyl hydride; Pyrobenzole
Haz Waste #: U019 Ind/EPA Gen #: K025
Formula: C6H6
Description: Clear, colorless, volatile, highly flammable liquid; a major raw material of the chemical industry; listed as a carcinogen by the EPA (Ref. 2, 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	78.11	2
Melting point (C):	5.53	2
Boiling point (C):	80.10	2
Density (g/cc, 20C):	0.8787	2
Vapor pressure (torr, 25C):	95.2000	3
Henry's law const (atm m**3/mol, 25C):	0.55500E-02	5
Solubility in water (mg/L, 25C):	0.17800E+12	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.13	3
Biodegradation rate in water (1/month):	Biodegraded	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 71-36-3 n-Butyl alcohol

Other Names: 1-Butanol; Butyl alcohol; Propyl carbinol
Haz Waste #: U031 Ind/EPA Gen #: F003
Formula: CH3CH2CH2CH2OH; C4H10O
Description: Highly refractive liquid; vapors irritate and cause cough

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	74.12	2
Melting point (C):	-90.00	2
Boiling point (C):	117.00 to 118.00	2
Density (g/cc, 20C):	0.8100	2
Solubility in water (mg/L, 25C):	9.1 ml/100 ml	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 110-82-7 Cyclohexane

Other Names: Hexahydrobenzene
Haz Waste #: U056 Ind/EPA Gen #:
Formula: C6H12

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	84.16	3
Melting point (C):	6.30	3
Boiling point (C):	81.00	3
Vapor pressure (torr, 25C):	77.0000	3
Henry's lawwconst (atm m**3/mol, 25C):	0.1600	3
Solubility in water (mg/L, 25C):	(20 C) 55.0000	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 108-94-1 Cyclohexanone

Other Names: Ketohexamethylene; Pimelic ketone; Hytrol O; Anone; Nadone
Haz Waste #: U057 Ind/EPA Gen #: F003
Formula: C6H10O
Description: Oily liquid; odor reminiscent of peppermint and acetone; vapor harmful (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	98.14	2
Melting point (C):	-32.10	2
Boiling point (C):	155.60	2
Density (g/cc, 20C):	0.9478	2
Solubility in water (mg/L, 25C):	87 g/L at 20 C	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 123-91-1 1,4-Dioxane

Other Names: 1,4-Diethylene dioxide; Dioxane; Di(ethylene oxide); Diethylene dioxide; Diethylene ether; Diethylene oxide; Diokan; 1,4-Dioxacyclohexane; Dioxan; 1,4-Dioxan; Dioxyethylene ether; Glycol ethylene ether; NCI-C03689; NE 220; Tetrahydro-p-dioxin; Tetrahydro-1,4-dioxin
Haz Waste #: U108 Ind/EPA Gen #:
Formula: C4H8O2
Description: Flammable liquid; faint, pleasant odor; vapor harmful; may cause CNS depression; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	88.10	2
Melting point (C):	11.80	2
Boiling point (C):	101.10	2
Density (g/cc, 20C):	1.0329	2
Solubility in water (mg/L, 25C):	Infinitely soluble	12

August 1987 NONHALOGENATED SOLVENTS
CAS #: 141-78-6 Ethyl acetate

Other Names: Acetic acid ethyl ester; Acetic ether; Vinegar naphtha
Haz Waste #: U112 Ind/EPA Gen #: F003
Formula: CH3COOC2H5; C4H8O2
Description: Clear, volatile, flammable liquid; characteristic fruity odor; pleasant taste when diluted (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	88.10	2
Melting point (C):	-83.00	2
Boiling point (C):	77.00	2
Density (g/cc, 20C):	0.9020	2
Solubility in water (mg/L, 25C):	1 mL/10 mL	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	24.00	15

August 1987 NONHALOGENATED SOLVENTS
CAS #: 60-29-7 Ethyl ether

Other Names: 1,1'-Oxybisethene; Ethoxyethane; Ether; Diethyl ether; Ethyl oxide; Diethyl oxide; Sulfuric ether; Anesthetic ether
Haz Waste #: U117 Ind/EPA Gen #: F003
Formula: C2H5OC2H5; C4H10O
Description: Mobile, very volatile, highly flammalbe liquid; vapor heavier than air; characteristic, sweetish, pungent odor; burning taste; tends to form explosive peroxides under the influence of air and light; mildly irritating to skin, mucous membranes; inhalation of high concentrations may cause unconsciousness and death due to respiratory paralysis; explosion hazard (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	74.12	2
Melting point (C):	-116.3 (stable crystals); -123.3 (metastable crystals)	2
Boiling point (C):	34.60	2
Density (g/cc, 20C):	0.7134	2
Vapor pressure (torr, 25C):	(mm Hg at 20 C) 439.80	2
Solubility in water (mg/L, 25C):	6.05% (w/w)	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 110-00-9 Furan

Other Names: Furfuran; Oxole; Tetrole; Divinylene oxide
Haz Waste #: U124 Ind/EPA Gen #:
Formula: C4H4O
Description: Liquid; varpors are narcotic; can be absorbed through skin (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	68.07	2
Boiling point (C):	(758 mm Hg) 32.00	2
Density (g/cc, 20C):	(19.4 C) 0.9371	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 98-01-1 Furfural

Other Names: Furfuraldehyde; 2-Furancarboxaldehyde; 2-Furaldehyde; Pyromucic aldehyde; Artificial oil of ants; "Furfurol"
Haz Waste #: U125 Ind/EPA Gen #:
Formula: C4OCHO; C5H4O2
Description: Colorless oily liquid; peculiar odor; turns yellow to brown on exposure to air and light and resinifies; irritates mucous membranes and acts on CNS; causes lacrimation, inflammation of eyes, irritation of throat, headache (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	96.09	3
Melting point (C):	-38.70	3
Boiling point (C):	162.00	3
Density (g/cc, 20C):	(25 C) 1.1563	2
Vapor pressure (torr, 25C):	(approx.) 1.6500	3
Solubility in water (mg/L, 25C):	(? C) 0.91000E+05	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Quantitative	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 78-83-1 Isobutanol

Other Names: 2-Methyl-1-propanol; Isobutyl alcohol
Haz Waste #: U140 Ind/EPA Gen #: F005
Formula: (H3C)2CHCH2OH; C4H10O
Description: Colorless, refractive liquid; flammable; moderately toxic; eye irritant (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	74.00	13
Melting point (C):	-108.00	13
Boiling point (C):	108.10	13
Solubility in water (mg/L, 25C):	Sparingly soluble	13

August 1987 NONHALOGENATED SOLVENTS
CAS #: 67-56-1 Methanol

Other Names: Methyl alcohol; Carbinol; Wood spirit; Wood alcohol
Haz Waste #: U154 Ind/EPA Gen #: F003
Formula: CH3OH; CH4O
Description: Flammable, poisonous, mobile liquid; slight alcoholic odor; poisoning may occur from ingestion, inhalation or percutaneous absorption (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	32.04	2
Melting point (C):	-97.80	2
Boiling point (C):	64.70	2
Density (g/cc, 20C):	(vapor density=1.11; air=1) 0.7915	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 78-93-3 Methyl ethyl ketone

Other Names: 2-Butanone; Ethyl methyl ketone
Haz Waste #: U159 Ind/EPA Gen #: F005
Formula: CH3COCH2CH3; C4H8O
Description: Flammable liquid; acetone-like odor

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	72.10	2
Melting point (C):	-86.00	2
Boiling point (C):	79.60	2
Density (g/cc, 20C):	0.8050	2
Solubility in water (mg/L, 25C):		
	Soluble in about 4 parts water (27.5%)	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 108-10-1 Methyl isobutyl ketone

Other Names: Isopropylacetone; 4-Methyl-2-pentanone; Hexone
Haz Waste #: U161 Ind/EPA Gen #: F003
Formula: CH3COCH2CH(CH3)2; C6H12O
Description: Colorless liquid; faint, ketonic and camphor odor

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	100.16	2
Melting point (C):	-84.70	2
Boiling point (C):	117.00 to 118.00	2
Density (g/cc, 20C):	0.8010	2
Solubility in water (mg/L, 25C):	Moderately soluble (1.91%)	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 79-46-9 2-Nitropropane

Haz Waste #: U171 Ind/EPA Gen #:
Formula: CH3CH(NO2)CH3; C3H7NO2
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	89.09	2
Melting point (C):	-93.00	2
Boiling point (C):	120.30	2
Density (g/cc, 20C):	(25 C) 0.9821	2
Solubility in water (mg/L, 25C):	Slightly soluble	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 109-06-8 2-Picoline

Other Names: alpha-Picoline; 2-Methylpyridine
Haz Waste #: U191 Ind/EPA Gen #:
Formula: C6H7N
Description: Colorless liquid; strong, unpleasant odor; irritating to respiratory tract (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	93.12	2
Melting point (C):	-70.00	2
Boiling point (C):	128.00 to 129.00	2
Density (g/cc, 20C):	(15 C) 0.9500	2
Solubility in water (mg/L, 25C):	Freely soluble	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 110-86-1 Pyridine

Haz Waste #: U196 Ind/EPA Gen #: F005
Formula: C5H5N
Description: Flammable, colorless liquid; characteristic disagreeable odor; sharp taste; may cause CNS depression, irritation of skin and respiratory tract (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	79.10	2
Melting point (C):	-42.00	2
Boiling point (C):	115.00 to 116.00	2
Density (g/cc, 20C):	(25 C) 0.9780	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 109-99-9 Tetrahydrofuran

Other Names: Diethylene oxide; Tetramethylene oxide
Haz Waste #: U213 Ind/EPA Gen #:
Formula: C4H8O
Description: Liquid; ether-like odor; irritating to skin, eyes, mucous membranes; narcotic in high concentrations (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	72.10	2
Melting point (C):	-108.50	2
Boiling point (C):	66.00	2
Density (g/cc, 20C):	0.8892	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOGENATED SOLVENTS
CAS #: 108-88-3 Toluene

Other Names: Toluol
Haz Waste #: U220 Ind/EPA Gen #: F005,K036
Formula: C6H5CH3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	92.13	3
Melting point (C):	-95.00	3
Boiling point (C):	111.00	3
Vapor pressure (torr, 25C):	28.7000	3
Henry's law!const (atm m**3/mol, 25C):	0.59300E-02	3
Solubility in water (mg/L, 25C):	535.00	3
RETENTION PROPERTIES:		Ref.
Biodegradation rate in water (1/month):	Significant	3

August 1987 NONHALOGENATED SOLVENTS
CAS #: 95-47-6 o-Xylene

Other Names: o-Dimethylbenzenes
Haz Waste #: U239 Ind/EPA Gen #: F003,K093,K094
Formula: CH3C6H4CH3
Description: Colorless liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	106.20	3
Melting point (C):	-25.20	3
Boiling point (C):	144.00	3
Vapor pressure (torr, 25C):	10.0000	3
Henry's law const (atm m**3/mol, 25C):	0.61200E-02	3

7.9 Reactive (Non-Cyanide)

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 131-74-8 Ammonium picrate

Other Names: 2,4,6-Trinitrophenol ammonium salt; Picric acid ammonium salt; ammonium picronitrate; ammonium carbazoate
Haz Waste #: P009 Ind/EPA Gen #:
Formula: C6H2(NO2)3ONH4
Description: Explodes easily from heat or shock (as solid); bright yellow bitter scales or orthorhombic crystals (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	246.14	2
Density (g/cc, 20C):	1.7200	2
Solubility in water (mg/L, 25C):	1 g/100 mL (20 C)	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 60-34-4 Methylhydrazine

Other Names: Monomethylhydrazine; MMH
Haz Waste #: P068 Ind/EPA Gen #:
Formula: CH3NHNH2; CH6N2
Description: Reducing agent; clear liquid; ignites spontaneously on contact with strong oxidizing agents (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	46.07	2
Melting point (C):	-52.40	1
Boiling point (C):	87.50	1
Density (g/cc, 20C):	(g/mL, 25 C) 0.2900	1
Vapor pressure (torr, 25C):	(kPa) 6.6200	1
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 55-63-0 Nitroglycerine

Other Names: 1,2,3-Propanetriol; 1,2,3-Propanetriol trinitrate; Glyceryl trinitrate; Glycerol nitric acid triester; Nitroglycerol; Glonoin; Trinitrin; Blasting gelatin; Blasting oil; S.N.G.; Angibid; Angiolingual; Anginine; Angorin; Cardamist; Corditrine; Gilucor "nitro"; Klavikordal; Lenitral; Myoglycerin; Nitrobid; Nitrodisc; Nitro-Dur; Nitroglin; Nitro Mack; Nitromel; Nitronal; Nitrong; NitroPRN; Nitrorectal; Nitroretard; Nitrostat; Nitrozell retard; Nysconitrine; Percutol; Perlinganit; Perglottal; Transderm-Nitro; Suscard; Sustac; Tridil; Trinalgon; others
Haz Waste #: P081 Ind/EPA Gen #:
Formula: $CH_2(ONO_2)CH(ONO_2)CH_2ONO_2$; $C_3H_5N_3O_9$
Description: Pale yellow, oily liquid; sweet, burning taste; produces headache on tasting; explodes on rapid heating or on concussion; crystallizes in two forms: labile and stable; appreciably volatile at 100 C; evolves nitrous yellow vapors at 135 C; acute poisonous; used for manufacture of dynamite (75% nitroglycerin) and as a vasodilator; begins to deocmpose at 100 C (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	227.09	2
Melting point (C):	2.8 (labile form); 13.5 (stable form)	2
Boiling point (C):	(explodes) 218.00	2
Vapor pressure (torr, 25C):	(mm, 20 C) 0.26000E-03	2
Solubility in water (mg/L, 25C):	1 g/800 mL	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 509-14-8 Tetranitromethane

Haz Waste #: P112 Ind/EPA Gen #:
Formula: $C(NO_2)_4$
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	196.04	2
Melting point (C):	13.80	2
Boiling point (C):	126.00	2
Density (g/cc, 20C):	(25 C) 1.6229	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 75-36-5 Acetyl chloride

Haz Waste #: U006 Ind/EPA Gen #:
Formula: CH3COCl; C2H3ClO
Description: Flammable liquid; pungent odor; extremely irritating to the eyes; decomposed violently by water or alcohol; irritant; corrosive; causes severe burns (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	78.50	2
Melting point (C):	-112.00	2
Boiling point (C):	52.00	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Decomposes violently	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 98-09-9 Benzenesulfonyl chloride

Other Names: Benzenesulfonic (acid) chloride; Benzene sulfonechloride
Haz Waste #: U020 Ind/EPA Gen #:
Formula: C6H5SO2Cl
Description: Colorless, oily liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	176.62	2
Melting point (C):	14.50	2
Boiling point (C):	(decomposes) 251.00 to 252.00	2
Density (g/cc, 20C):	(15 C) 1.3842	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolysis rate, .00294 sec**-1	10

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 98-07-7 Benzotrichloride

Other Names: (Trichloromethyl)benzene; Phenylchloroform; alpha,alpha,alpha-Trichlorotoluene; Benzenyl trichloride; omega,omega,omega-Trichlorotoluene; Toluene trichloride
Haz Waste #: U023 Ind/EPA Gen #:
Formula: C7H5Cl3
Description: Liquid; fumes in air; vapors highly irritant to skin, mucous membranes (Ref. 2); suspected carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	195.48	2
Melting point (C):	-5.00	2
Boiling point (C):	220.80	2
Density (g/cc, 20C):	1.3756	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolyzes	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 1615-80-1 Diethylhydrazine

Other Names: 1,2-Diethylhydrazine; Hydrazoethane
Haz Waste #: U086 Ind/EPA Gen #:
Formula: CH3CH2NHNHCH3CH2; C4H12N2
Description: Toxic; experimental transplacental carcinogen (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		88.00	13
Boiling point (C):	85.00 to	86.00	13

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 80-15-9 alpha,alpha-Dimethylbenzyl hydroperoxide

Other Names: 1-Methyl-1-phenylethyl-hydroperoxide
Haz Waste #: U096 Ind/EPA Gen #:
Formula: C9H12O2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	152.19	17

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 57-14-7 1,1-Dimethylhydrazine

Other Names: unsym-Dimethylhydrazine; asym-Dimethylhydrazine; N,N-Dimethylhydrazine; UDMH; Dimazine
Haz Waste #: U098 Ind/EPA Gen #:
Formula: (CH3)2NNH2; C2H8N2
Description: Flammable, hygroscopic, mobile liquid; fumes in air and gradually turns yellow; highly corrosive and irritating to skin, eyes, mucous membranes; convulsant poison; base in rocket fuel formulations (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	60.10	2
Melting point (C):	-58.00	2
Boiling point (C):	63.90	2
Density (g/cc, 20C):	(22 C) 0.7910	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 540-73-8 1,2-Dimethyl hydrazine

Other Names: N,N-dimethylhydrazine
Haz Waste #: U099 Ind/EPA Gen #:
Formula: CH3NHNHCH3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	60.10	2
Boiling point (C):	(753 torr) 81.00	2
Density (g/cc, 20C):	0.8274	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 77-78-1 Dimethyl sulfate

Other Names: Sulfuric acid mimethyl ester; Dimethyl monosulfate; Methyl sulfate; DMS
Haz Waste #: U103 Ind/EPA Gen #:
Formula: (CH3)2S04; C2H604S
Description: Colorless, oily liquid; extremely hazardous; no warning characteristics; delayed appearance of symptoms; liquid produces severe blistering and necrosis of skin; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	126.13	2
Melting point (C):	-27.00	2
Boiling point (C):	(decomposes) 188.00	2
Density (g/cc, 20C):	1.3322	2
Solubility in water (mg/L, 25C):	2.8 g/100 mL (18 C)	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Rapid hydrolysis	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 122-66-7 1,2-Dipehnylhydrazine

Other Names: Hydrazobenzene; Hydrazodibenzene; 1,1'-Hydrazobisbenzene; (sym)-Dipehnylhydrazine; N,N'-Diphenylhydrazine; NCI-C01854
Haz Waste #: U109 Ind/EPA Gen #:
Formula: C12H12N2
Description: A carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	184.24	10
Solubility in water (mg/L, 25C):	0.22100E-03	10
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.94	10
Partition coefficient, soil/water:	75.6000	17

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 302-01-2 Hydrazine

Other Names: Diamine
Haz Waste #: U133 Ind/EPA Gen #:
Formula: H2NNH2
Description: Liquid; reducing agent

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	32.05	2
Boiling point (C):	113.50	2
Density (g/cc, 20C):	(25 C) 1.0036	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 1338-23-4 Methyl ethyl ketone peroxide

Other Names: 2-Butanone peroxide; NCI-C55447;
Methylethylketonhydroperoxide
Haz Waste #: U160 Ind/EPA Gen #:
Formula: C8H16O4
Description: Skin and eye irritant

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	176.24	14

August 1987 REACTIVE (NON-CYANIDE)
CAS #: 99-35-4 sym-Trinitrobenzene

Other Names: 1,3,5-Trinitrobenzene; Benzite
Haz Waste #: U234 Ind/EPA Gen #:
Formula: C6H3(NO2)3; C6H3N3O6
Description: Orthorhombic bipyramidal plates; can be sublimed by careful heating; explodes when headed rapidly; less sensitive to impact than TNT, but more powerful and brisant (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	213.11	2
Density (g/cc, 20C):	1.7600	2
Solubility in water (mg/L, 25C):	0.035 g/100 g	2

7.10 Nonhalogenated Pesticides

August 1987 NONHALOG. PESTICIDES
CAS #: 81-81-2 Hydroxycoumarin salts

Other Names: Warfarin; 4-Hydroxy-3-(3-oxo-1-phenylbutyl)-2H-1-benzopyran-2-one; 3-(alpha-acetonylbenzyl)-4-hydroxy-coumarin; 1-(4'-hydroxy-3'-coumarinyl)-1-phenyl-3-butanone; 3-alpha-phenyl-beta-acetylethyl-4-hydroxycoumarin; Compound 42; Coumadine; WARF compound 42; Athrombine-K; Sodium salt--Marevan; Prothromadin; Tintorane; Warfilone; Waran
Haz Waste #: P001,U248 Ind/EPA Gen #:
Formula: C19H16O4; Sodium salt, C19H15NaO4
Description: Crystals; Sodiums salt--Slightly bitter, crystalline powder Depresses formation of prothrombin and increases capillary fragility, leading to hemorrhages (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	308.32	2
Melting point (C):	161.; 117.-118. for acidic enol which forms salts	2

August 1987 NONHALOG. PESTICIDES
CAS #: 357-57-3 Brucine

Other Names: 2,3-Dimethoxystrychnidin-10-one; 10,11-dimethoxystrychnine
Haz Waste #: P018 Ind/EPA Gen #:
Formula: C23H26N2O4
Description: Highly toxic alkaloid resembling strychnine; possible carcinogen

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	394.47	2
Melting point (C):	178.00	2
Solubility in water (mg/L, 25C):	1 g/1320 mL	2

August 1987 NONHALOG. PESTICIDES
CAS #: 88-85-7 Dinoseb

Other Names: 2,4-Dinitro-6-(1-methylpropyl)-phenol; DNBP; ENT 1122; 2-(1-Methylpropyl)-4,6-dinitrophenol; WSX 8365; Chemox PE; 2-sec-Butyl-4,6-dinitrophenol; Dow General; Premerge; Subitex; Caldon; Basanite
Haz Waste #: P020 Ind/EPA Gen #:
Formula: C10H12N2O5
Description: Orange-brown viscous liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	240.22	2
Melting point (C):	38.00 to 42.00	2

August 1987 NONHALOG. PESTICIDES
CAS #: 298-04-4 Disulfoton

Other Names: O,O-Diethyl-S-[2-(ethylthio)ethyl]phosphoro dithioate
Haz Waste #: P039 Ind/EPA Gen #: K036,K037
Formula: C8H19O2PS3
Description: Oil

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	274.40	3
Melting point (C):	> -25.	3
Boiling point (C):	(1.5 torr) 132.00 to 133.00	3
Density (g/cc, 20C):	1.1440	2
Vapor pressure (torr, 25C):	(20 C) 0.18000E-03	3
Henry's law const (atm m**3/mol, 25C):	0.25000E-05	3
Solubility in water (mg/L, 25C):	(23 C) 25.0000	3

August 1987 NONHALOG. PESTICIDES
CAS #: 297-97-2 O,O-Diethyl P

Other Names: O,O-Diethyl-O-(2-pyrazinyl)phosphorthioate; Thionazin; Phosphorothioic acid O,O-Diethyl O-pyrazinyl ester; ethyl pyrazinyl phosphorothioate; EN-18133; ENT 25580; American Cyanamid 18133; Cynem; Nemafos; Zinophos
Haz Waste #: P040 Ind/EPA Gen #:
Formula: C8H13N2O3PS
Description: Amber liquid; cholinesterase inhibitor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	248.26	2
Melting point (C):	-1.70	2
Boiling point (C):	80.00	2
Vapor pressure (torr, 25C):	(mm Hg at 30 C) 0.30000E-02	2
Solubility in water (mg/L, 25C):	Slightly soluble	2

August 1987 NONHALOG. PESTICIDES
CAS #: 311-45-5 Diethyl p-nitrophenyl phosphate

Other Names: Phosphoric acid diethyl 4-nitrophenyl ester; Paraoxon; Phosphacol; E 600; Ester 25; Eticol; Fosfakol; Mintacol; Iostisal A; Soluglaucit
Haz Waste #: P041 Ind/EPA Gen #:
Formula: C10H14NO6P
Description: Oily liquid; slight odor; poisonous; cholinesterase inhibitor. (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	275.21	2
Boiling point (C):	169.00 to 170.00	2
Density (g/cc, 20C):	(25 C) 1.2683	2
Solubility in water (mg/L, 25C):	2400. ug/mL	2

August 1987 NONHALOG. PESTICIDES
CAS #: 55-91-4 Diisopropyl fluorophosphate

Other Names: Isoflurophate; Phosphorofluoridic acid bis(1-methylethyl) ester; Isopropyl fluophosphate; Diisopropyl fluorophosphonate; Diisopropylphosphorofluoridate; Fluostigmine; Isofluorphate; DFP; Diflupyl; Dyflos; Floropryl; Fluropryl
Haz Waste #: P043 Ind/EPA Gen #:
Formula: C6H14FO3P
Description: Liquid; traces of vapor cause myosis; highly toxic; cholinesterase inactivator (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	184.15	2
Melting point (C):	-82.00	2
Boiling point (C): (by extrapolation)	183.00	2
Density (g/cc, 20C):	1.0550	2
Vapor pressure (torr, 25C): (mm Hg at 20 C)	0.5790	2
Solubility in water (mg/L, 25C): 1.54% w/w (decomposes; pH about 2.5; forms HF)		2

August 1987 NONHALOG. PESTICIDES
CAS #: 60-51-5 Dimethoate

Other Names: Phosphorodithioic acid O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester; phosphorodithioic acid O,O-dimethyl ester; ester with 2-mercapto-N-methylacetamide; O,O-dimethyl S-methylcarbamoylmethyl phosphorodithioate; American Cyanamid 12880; Cygon; Fostion MM; Perfekthion; Rogor; Roxion
Haz Waste #: P044 Ind/EPA Gen #:
Formula: C5H12NO3PS2
Description: Crystals; cholinesterase inhibitor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	229.28	2
Melting point (C): 52.00 to	52.50	2
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C): (65 C)	1.28	2
Hydrolysis rate, water (1/month, 25C): Hydrolyzes in alkaline solution		2
Biodegradation rate in water (1/month): Very slightly soluble		2

August 1987 NONHALOG. PESTICIDES
CAS #: 39196-18-4 3,3-Dimethyl

Other Names: 3,3-Dimethyl-1-(methylthio)-2-butanone-O-[(methylamino)carbonyl]oxime; Dacamox; Thiofanox; 3,3-Dimethyl-1-(methylthio)butanone O-methylcarbamoyloxime
Haz Waste #: P045 Ind/EPA Gen #:
Formula: C9H18N2O2S
Description: Solid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	218.00	13
Melting point (C):	56.50 to 57.50	13

August 1987 NONHALOG. PESTICIDES
CAS #: 534-52-1 4,6-Dinitro-o-cresol

Other Names: DNOC; Dinitrocresol; 2-Methyl-4,6-dinitrophenol; 3,5-Dinitro-2-hydroxytoluene; 3,5-Dinitro-o-cresol; DN; DNC; Antinonnin; Detal; Dinitrol; Elgetol; K III; K IV; Ditrosol; Prokarbol; Effusan; Lipan; Selinon; Sinox; Dekrysil
Haz Waste #: P047 Ind/EPA Gen #:
Formula: C6H2(NO2)2(OH)(CH3)
Description: Yellow prisms; skin contact may lead to local necrosis and dangerous systemic effects; a cumulative poison (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	198.13	2
Melting point (C):	85.80	3
Henry's law const (atm m**3/mol, 25C):	0.14000E-05	3
Solubility in water (mg/L, 25C):	(? C) 250.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.85	3
Partition coefficient, soil/water:	7.4800	17
Biodegradation rate in water (1/month):	Not significant	3

August 1987 NONHALOG. PESTICIDES
CAS #: 541-53-7 2,4-Dithiobiuret

Other Names: Thioimidodicarbonic diamide
Haz Waste #: P049 Ind/EPA Gen #:
Formula: NH2CSNHCSNH2
Description: Monoclinic or triclinic crystals; poisonous when ingested

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	135.20	2
Melting point (C):	decomposes 181.00	2
Density (g/cc, 20C):	(30 C) 1.5220	2
Solubility in water (mg/L, 25C):	0.27 g/100 mL (27 C)	2

August 1987 NONHALOG. PESTICIDES
CAS #: 16752-77-5 Methomyl

Other Names: N-[[(Methylamino)carbonyl]oxy]ethan-imidothioic acid methyl ester; N-[(methylcarbamoyl)oxy]thio-acetimidic acid methyl ester; S-methyl N-[(methylcarbamoyl)oxy]thioacetimidate; methyl O-(methylcarbamoyl)thiol-acetohydroxamate; Insecticide 1179; Lannate; Nudrin
Haz Waste #: P066 Ind/EPA Gen #:
Formula: C5H10N2O2S
Description: Crystals

PHYSICAL PROPERTIES:				Ref.
Molecular weight:			162.20	2
Melting point (C):	78.00	to	79.00	2
Density (g/cc, 20C):		(24 C)	1.2946	2
Solubility in water (mg/L, 25C):			5.8%	2

August 1987 NONHALOG. PESTICIDES
CAS #: 116-06-3 Aldicarb

Other Names: 2-Methyl-2-(methylthio)propanal O-[(methylamino)carbonyl] oxime; 2-methyl-2-(methyltio)propionaldehyde O-(methylcarbamoyl)oxime; UC 21149; Temik
Haz Waste #: P070 Ind/EPA Gen #:
Formula: CH3SC(CH3)2CH=NOCONHCH3
Description: Crystals.

PHYSICAL PROPERTIES:				Ref.
Molecular weight:			190.25	2
Melting point (C):	99.00	to	100.00	2
Solubility in water (mg/L, 25C):			0.6%w	2

August 1987 NONHALOG. PESTICIDES
CAS #: 298-00-0 Methyl parathion

Other Names: O,O-Dimethyl O-p-nitrophenyl phosphorothioate; Phosphorothioic acid O,O-dimethyl O-(4-nitrophenyl) ester; O,O-dimethyl O-p-nitrophenyl thiophosphate; Dimethyl parathion; Parathion-methyl; Metaphos; E 601; ENT-17292; Dalf; Folidol-M; Metacide; Metron; Nitrox 80
Haz Waste #: P071 Ind/EPA Gen #:
Formula: (CH3O)2PSO-C6H4NO2
Description: Crystals; cholinesterase inhibitor (Ref. 2)

PHYSICAL PROPERTIES:				Ref.
Molecular weight:			263.23	2
Melting point (C):	35.00	to	36.00	3
Boiling point (C):			Unstable	3
Density (g/cc, 20C):			1.3580	2
Vapor pressure (torr, 25C):		(20 C)	0.97000E-05	3
Henry's lawwconst (atm m**3/mol, 25C):			0.54000E-07	3
Solubility in water (mg/L, 25C):	55.0000	to	60.0000	3

August 1987 NONHALOG. PESTICIDES
CAS #: 86-88-4 1-Naphthyl-2-thiourea

Other Names: BANTU; 1-Naphthalenylthiourea; ANTU; Krysid; Chemical 109; 1-(1-Naphthyl)-2-thiourea; alpha-Naphthylthiourea; Anturat; N-1-Naphthylthiourea; alpha-Naphthylthiocarbamide; Rattrack
Haz Waste #: P072 Ind/EPA Gen #:
Formula: C11H10N2S
Description: Prisms; toxic; bitter taste

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	202.27	2
Melting point (C):	198.00	2
Solubility in water (mg/L, 25C):	0.06 g/100 mL	2

August 1987 NONHALOG. PESTICIDES
CAS #: 54-11-5 Nicotine

Other Names: 3-(1-Methyl-2-pyrrolidinyl)pyridine; 1-Methyl-2-(3-pyridyl)pyrrolidine; beta-Pyridyl-alpha-N-methyl-pyrrolidine
Haz Waste #: P075 Ind/EPA Gen #:
Formula: C10H14N2
Description: Colorless to pale yellow, oily liquid; very hygroscopic; turns brown on exposure to air or light; acrid, burning taste; develops odor of pyridine; highly toxic; base is absorbed through mucous membranes and intact skin, but the salts (hydrochloride, dihydrochloride, sulfate, tartarate, zinc chloride, salicylate) are not (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	162.23	2
Boiling point (C):	(745 torr), partial decomposition 247.00	2
Density (g/cc, 20C):	1.0097	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOG. PESTICIDES
CAS #: 152-16-9 Octamethylpyrophosphoramide

Other Names: Schradan; Octamethyl pyrophosphoramide; Pestox III; bis[bisdimethylaminophosphonous] anhydride; OMPA; Sytam; bis-N,N,N',N'-tetramethylphosphorodiamidic anhydride
Haz Waste #: P085 Ind/EPA Gen #:
Formula: C8H24N4O3P2
Description: Viscous liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	286.26	2
Melting point (C):	14.00 to 20.00	2
Boiling point (C):	120.-125. (0.5 atm); 154. (2.0 atm)	2
Density (g/cc, 20C):	(25 C) 1.0900	2
Vapor pressure (torr, 25C):	(mm Hg) 0.10000E-02	2
Solubility in water (mg/L, 25C):	Miscible	2

August 1987 NONHALOG. PESTICIDES
CAS #: 145-73-3 7-Oxabicyclo

Other Names: ENDOTHALL; 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid
Haz Waste #: P088 Ind/EPA Gen #:
Formula: C8H10O5

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	186.16	2
Solubility in water (mg/L, 25C):	10 g/100 mL (20 C)	2

August 1987 NONHALOG. PESTICIDES
CAS #: 56-38-2 Parathion

Other Names: O,O-Diethyl O-p-nitrophenyl phosphorothioate; DNTP; S.N.P.; Phosphorothioic acid O,O-diethyl O-(4-nitrophenyl) ester; Diethyl-p-nitrophenyl monothiophosphate; E 605; AC 3422; ENT 15108; Alkron; Alleron; Aphamite; Etilon; Folidol; Fosferno; Niran; Paraphos; Rhodiatox; Thiophos
Haz Waste #: P089 Ind/EPA Gen #:
Formula: (C2H5O)2PSOC6H4NO2; C10H14NO5PS
Description: Pale, yellow liquid; highly toxic; cholinesterase inhibitor effects are cumulative; special precautions necessary to prevent inhalation and skin contamination (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	291.30	3
Melting point (C):	6.10	3
Boiling point (C):	375.00	3
Density (g/cc, 20C):	(25 C) 1.2600	2
Vapor pressure (torr, 25C):	(20 C) 0.37800E-04	3
Henry's law'const (atm m**3/mol, 25C):	0.61000E-06	3
Solubility in water (mg/L, 25C):	24.0000	3

August 1987 NONHALOG. PESTICIDES
CAS #: 103-85-5 N-Phenylthiourea

Other Names: Phenylthiourea; Phenylthiocarbamide
Haz Waste #: P093 Ind/EPA Gen #:
Formula: C6H5NHCSNH2; C7H8N2S
Description: Bitter or tasteless needles

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	152.22	2
Melting point (C):	154.00	2
Density (g/cc, 20C):	1.3000	2
Solubility in water (mg/L, 25C):	1 part/400 (? C)	2

August 1987 NONHALOG. PESTICIDES
CAS #: 298-02-2 Phorate

Other Names: Phosphorodithioic acid O,O-diethyl S-[(ethylthio)methyl] ester
Haz Waste #: P094 Ind/EPA Gen #: K038,K039,K040
Formula: (C2H5O)2PS-SCH2SC2H5
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	260.40	2
Density (g/cc, 20C):	(25 C) 1.1560	2
Vapor pressure (torr, 25C):	(mm Hg) 0.84000E-03	2
Solubility in water (mg/L, 25C):	(ppm) 50.0000	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolyzes	2

August 1987 NONHALOG. PESTICIDES
CAS #: 52-85-7 Famphur

Other Names: Phosphorothioic acid O-[4-[(dimethylamino)sulfonyl]phenyl] O,O-dimethyl ester; Phosphorothioic acid O,O-dimethyl ester; O-Ester with p-hydroxy-N,N-dimethylbenzenesulfonamide; O,O-Dimethyl-O,p-(dimethylsulfamoyl)phenyl phosphorothioate; p-Hydroxy-N,N-dimethylbenzenesulfonamide ester with phosphorothioic acid O,O-dimethyl ester; Famophos; American Cyanamid 38023; ENT 25644; Warbex
Haz Waste #: P097 Ind/EPA Gen #:
Formula: (CH3O)2PSOC6H4SO2N(CH3)2
Description: Crystals; cholinesterase inhibitor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	325.36	2
Melting point (C):	52.50 to 53.50	2

August 1987 NONHALOG. PESTICIDES
CAS #: 57-24-9 Strychnine and salts

Other Names: Strychnidin-10-one
Haz Waste #: P108 Ind/EPA Gen #:
Formula: C21H22N2O2
Description: Very bitter, orthorhombic, spehnoidal prisms; salts are acetate (crystals); arsenate dihydrate (efflorescent crystals); dichromate (orange-yellow needles); formate (crystals); gluconate pentahydrate (crystals); glycerophosphate hexahydrate; hydrobromide monohydrate (efflorescent crystans); hydrochloride dihydrate (efflorescent, trimetric prisms); nitrate; phosphate; salicylate (leaflets); valerate (crystals); extremely poisonous (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		334.40	3
Melting point (C):	268.00 to	290.00	3
Boiling point (C):	(5 torr)	270.00	3
Density (g/cc, 20C):		1.3600	2
Solubility in water (mg/L, 25C):	(? C)	156.00	3

August 1987 NONHALOG. PESTICIDES
CAS #: 3689-24-5 Tetraethyldithiopyrophosphate

Other Names: Dithiopyrophosphoric acid tetraethyl ester; Tetraethyl thiodiphosphate; Tetraethyl dithiopyrophosphate; Sulfotep
Haz Waste #: P109 Ind/EPA Gen #:
Formula: C8H20O5P2S2
Description: Oil; corrodes iron; highly toxic (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		322.00	13
Boiling point (C):	110.00 to	113.00	13
Solubility in water (mg/L, 25C):	Slightly soluble	(670 ppm)	13

August 1987 NONHALOG. PESTICIDES
CAS #: 107-49-3 Tetraethylpyrophosphate

Other Names: Diphosphoric acid tetraethyl ester
Haz Waste #: P111 Ind/EPA Gen #:
Formula: (C2H5O)2P(O)OP(OC2H5)2
Description: Liquid

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		290.20	2
Melting point (C):	decomposes 170.00 to	213.00	2
Density (g/cc, 20C):		1.1850	2
Vapor pressure (torr, 25C):	0.00047 mm Hg	(30 C)	2
Solubility in water (mg/L, 25C):		Miscible	2

RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):		
	Hydrolyzes quickly, t1/2 about 7 hrs (25 C)	2

August 1987 NONHALOG. PESTICIDES
CAS #: 137-26-8 Thiram

Other Names: Tetramethylthioperoxydicarbonic diamide; TMTD; ENT 987; Bis(dimethylthiocarbamoyl) disulfide; SQ 1489; NSC 1771; Bis(dimethylthiocarbamyl) disulfide; Thiurad; Thiosan; Tetramethylthiuram disulfide; Thylate; Tiuramyl; Thiuramyl; Puralin; Fernasan; Nomersan; Rezifilm; Pomarsol; Tersan; Tuads; Tulisan; Arasan
Haz Waste #: P117,U244 Ind/EPA Gen #:
Formula: C6H12N2S4
Description: Crystals; irritant of mucous membranes and skin (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	240.44	2
Melting point (C): (commercial grades, 146.)	155.00 to 156.00	2
Density (g/cc, 20C):	1.2900	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 NONHALOG. PESTICIDES
CAS #: 50-07-7 Mitomycin C

Other Names: [1aR]-6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methylazirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione, Ametycine; MMC; Mitocin-C; Mutamycin
Haz Waste #: U010 Ind/EPA Gen #:
Formula: C15H18O5N4
Description: Blue-violet crystals; used in cancer chemotherapy (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Melting point (C):	> 360.	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 NONHALOG. PESTICIDES
CAS #: 61-82-5 Amitrole

Other Names: 3-Amino-1H-1,2,4-triazole; Aminotriazole; ATA; ENT 25445; Amizol; Cytrol; Weedazol; Amerol; 3-Amino-S-triazole; Amino triazole weedkiller 90; 3-Amino-1,2,4-triazole; 5-Amino-1,2,4-triazole; Amitrol; Amitril; AT; ATA; Azaplant; Azole; Diurol; Domatol; Elmasil; Emisol; Fenamine; Herbizole; Kleer-lot; Orga-414; Ramizol; Simazol; USAF XR-22; Vorox; Weedazin; Weedoclor; (other commercial names)
Haz Waste #: U011 Ind/EPA Gen #:
Formula: C2H4N4
Description: Crystals; listed as a carcinogen by the EPA (Ref. 2); will persist in soil for several weeks and in water for more than 200 days after application; canceled for use on croplands July 1971 (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	84.08	2
Melting point (C):	159.00	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 NONHALOG. PESTICIDES
CAS #: 492-80-8 Auramine

Other Names: 4,4'-(Imidocarbonyl)bis(N,N-dimethylaniline); Auramine base; 4,4'-(Iminocarbonyl)bis(N,N-dimethylaniline); Auramine OAF; Apyonine auramine base; Auremine; Brilliant oil yellow; Bis(P-dimethylaminophenyl)methyleneimine; Glauramine; C.I. Solvent yelloww34; C.I. 41000B; Waxoline yellow O; 4,4'-Dimethylaminobenzophenonimide; Yellow pyoctanine; Tetramehtyldiaminodiphenylacetimine; Basic yellow 2 4,4'-Carbonimidoylbis(N,N-dimethyl)benzenamine
Haz Waste #: U014 Ind/EPA Gen #:
Formula: C17H21N3
Description: Yellow leaves or needles; used industrially as a dye or dye intermediate; vapors harmful; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	267.37	17
Solubility in water (mg/L, 25C):	Insoluble	12

August 1987 NONHALOG. PESTICIDES
CAS #: 50-18-0 Cyclophosphamide

Other Names: N,N-Bis(2-chloroethyl)tetrahydro-2H-1,3,2-oxazaphosphorin-2-amine 2-oxide; 2-[Bis(2-chloroethyl)amino]tetrahydro-2H-1,3,2-oxazophosphorine 2-oxide; 1-Bis(2-chloroethyl)amino-1-oxo-2-aza-5-oxaphosphoridin; Cyclophosphane; B518; Bis(2-chloroethyl)phosphamide cyclic propanolamide ester; Bis(2-chloroethyl)phosphoramide cyclic propanolamide ester; N,N-Bis(beta-chloroethyl)-N',O-propylenephosphoric acid ester diamide; N,N-Bis(beta-chloroethyl)-N',O-trimethylenephosphoric acid ester diamide; Cytophosphane; Cytoxan; Endoxan; Procytox; Sendoxan; ASTA; (many other)
Haz Waste #: U058 Ind/EPA Gen #:
Formula: C7H15Cl2N2O2P
Description: Monohydrate; listed as a carcinogen by the EPA (Ref. 2); a widely used synthetic druge used in cancer chemotherapy and chemically related to the nitrogen mustards (Ref. 12)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		261.10	2
Melting point (C):	41.00 to	45.00	2
Solubility in water (mg/L, 25C):		0.40000E+05	2

August 1987 NONHALOG. PESTICIDES
CAS #: 3288-58-2 O,O-Diethyl

Other Names: Phosphorodithioic acid, O,O-diethyl S-methyl ester
Haz Waste #: U087 Ind/EPA Gen #:
Formula: C5H13O2PS2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	200.25	17

August 1987 NONHALOG. PESTICIDES
CAS #: 111-54-6 Ethylene bis-dithiocarbamate

Other Names: Ethylene bis(dithiocarbamic acid); Ethylenebisdithiocarbamic acid; 1,2-Ethanediylbiscarbamodithioic acid
Haz Waste #: U114 Ind/EPA Gen #:
Formula: C4H8N2S4
Description: Parent acid very unstable; decomposes to CS2 and ethylenethiourea (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	212.00	13

August 1987 NONHALOG. PESTICIDES
CAS #: 75-60-5 Cacodylic acid

Other Names: Hydroxydimethylarsine oxide; Dimethylarsinic acid; Phytar
Haz Waste #: U136 Ind/EPA Gen #: K031
Formula: (CH3)2As(O)OH; C2H2AsO2
Description: Crystals; hygroscopic; poisonous; herbicide

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	137.99	2
Melting point (C):	195.00 to 196.00	2
Solubility in water (mg/L, 25C):	Soluble in 0.5 part water	2

7.11 Organo-Nitrogens

August 1987 ORGANO-NITROGENS
CAS #: 122-09-8 P-alpha-Dimethylphenethylamine

Other Names: alpha,alpha-Dimethylphenethylamine; Phentermine; alpha,alpha-Diemthylbenzeneethanamine; Phenyl-tert-butylamine; alpha-benzylisopropylamine
Haz Waste #: P046 Ind/EPA Gen #:
Formula: CH3C6H4CH2(NH2)CHCH3
Description: Oily liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	149.23	2
Boiling point (C):	(10) 103.00 to 103.00	2

August 1987 ORGANO-NITROGENS
CAS #: 62-75-9 N-Nitrosodimethylamine

Other Names: Dimethylnitrosoamine; N-Methyl-N-nitrosomethanamine; DMN; DMNA; Dimethylnitrosamine; N,N-Dimethylnitrosamine; NDMA; N-Nitroso-N,N-dimethylamine
Haz Waste #: P082,U100 Ind/EPA Gen #:
Formula: (CH3)2NN=O; C2H6N2O
Description: Yellow liquid; potent carcinogen; listed as a carcinogen by the EPA (Ref. 2); oily liquid (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	74.08	3
Boiling point (C):	151.00 to 153.00	3
Density (g/cc, 20C):	1.0048	2
Solubility in water (mg/L, 25C):	Miscible	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	0.06	3
Partition coefficient, soil/water:	0.1900	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 ORGANO-NITROGENS
CAS #: 86-30-6 N-nitroso-diphenylamine

Other Names: Diphenylnitrosoamine
Haz Waste #: P083 Ind/EPA Gen #:
Formula: (C6H5)2N=O
Description: Note (4/7/87): These values may be for p-nitroso

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	198.22	2
Melting point (C):	144.00 to 145.00	2
Solubility in water (mg/L, 25C):	Slightly	2
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.57	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 ORGANO-NITROGENS
CAS #: 4549-40-0 N-Nitroso-methylvinylamine

Other Names: N-Methyl-N-nitrosoethenamine; MVNA; NMVA;
N-Methyl-N-nitroso-ethenylamine
Haz Waste #: P084 Ind/EPA Gen #:
Formula: C3H6N2O
Description: Pale yellow liquid; very volatine; photolabile;
a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	86.09	17
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 ORGANO-NITROGENS
CAS #: 124-40-3 Dimethylamine

Other Names: N-Methylmethanamine
Haz Waste #: U092 Ind/EPA Gen #:
Formula: (CH3)2NH

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	45.08	2
Melting point (C):	-96.00	2
Boiling point (C):	7.00	2
Solubility in water (mg/L, 25C):	Very soluble	2

August 1987 ORGANO-NITROGENS
CAS #: 121-14-2 2,4-Dinitrotoluene

Other Names: DNT; 1-methyl-2,4-dinitrotoluene
Haz Waste #: U105 Ind/EPA Gen #:
Formula: C6H3(NO2)2CH3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	182.10	3
Melting point (C):	70.00	3
Boiling point (C):	300.00	3
Vapor pressure (torr, 25C):	(59 C) 0.13000E-02	3
Henry's law const (atm m**3/mol, 25C):	0.46800E-04	3
Solubility in water (mg/L, 25C):	(22 C) 270.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.01	3
Partition coefficient, soil/water:	10.9000	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 ORGANO-NITROGENS
CAS #: 606-20-2 2,6-Dinitrotoluene

Other Names: Dinitrotoluol
Haz Waste #: U106 Ind/EPA Gen #:
Formula: C6H3(NO2)2CH3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	182.10	3
Melting point (C):	63.00	3
Boiling point (C):	285.00	3
Vapor pressure (torr, 25C):	(20 C) 0.35000E-03	3
Solubility in water (mg/L, 25C):	(20 C) 0.10000E-02	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.05	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 ORGANO-NITROGENS
CAS #: 142-84-7 N-Dipropylamine

Other Names: N-Propylpropanamine; Dipropylamine
Haz Waste #: U110 Ind/EPA Gen #:
Formula: (CH3CH2CH2)2NH
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	101.19	2
Melting point (C):	-63.00	2
Boiling point (C):	110.00	2
Density (g/cc, 20C):	0.7380	2
Solubility in water (mg/L, 25C):	Freely soluble	2

August 1987 ORGANO-NITROGENS
CAS #: 621-64-7 di-n-Propylnitrosamine

Other Names: N-nitroso-di-n-propylamine; Dipropylnitrosamine;
N,N-Dipropylnitrosamine; DPN; DPNA; NDPA;
Nitrosodipropylamine; N-Nitrosodipropylamine;
N-Nitroso-N-propyl-1-propanamine
Haz Waste #: U111 Ind/EPA Gen #:
Formula: (C3H7)2N=O
Description: Yellow liquid; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	130.20	3
Boiling point (C):	205.00	3
Solubility in water (mg/L, 25C):	9900.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.31	3
Partition coefficient, soil/water:	2.5400	17
Biodegradation rate in water (1/month):	Not significant	3

August 1987 ORGANO-NITROGENS
CAS #: 134-32-7 1-Naphthylamine

Other Names: 1-Naphthalenamine
Haz Waste #: U167 Ind/EPA Gen #:
Formula: C10H8NH2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	143.18	2
Melting point (C):	50.00	2
Boiling point (C):	301.00	2
Solubility in water (mg/L, 25C):	1 part/590 (7 C)	2

August 1987 ORGANO-NITROGENS
CAS #: 91-59-8 2-Naphthylamine

Other Names: 2-Aminonaphthalene; C.I. 37270; Fast scarlet base B; NA; 2-Naphthalamine; 2-Naphthalenamine; beta-Naphthylamine; 6-Naphthylamine; 2-Naphthylamine mustard; USAF CB-22
Haz Waste #: U168 Ind/EPA Gen #:
Formula: C10H7NH2; C10H9N
Description: White to reddish crystals; volatile with steam; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	143.18	2
Melting point (C):	111.00 to 113.00	2
Boiling point (C):	306.00	2
Density (g/cc, 20C):	(98 C) 1.0610	2
Solubility in water (mg/L, 25C):	Soluble in hot water	2

August 1987 ORGANO-NITROGENS
CAS #: 98-95-3 Nitrobenzene

Other Names: Oil of Mirbane; Nitrobenzol; Essence of mirbane
Haz Waste #: U169 Ind/EPA Gen #: F004,K025,K104
Formula: C6H5NO2
Description: Colorless to pale yellow, oily liquid; odor of volatile oil almond; poisonous; rapidly absorbed through skin; vapor hazardous (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	123.11	2
Melting point (C):	5.60	3
Boiling point (C):	211.00	3
Density (g/cc, 20C):	(15 C) 1.2050	2
Vapor pressure (torr, 25C):	(20 C) 0.1500	3
Henry's law const (atm m**3/mol, 25C):	0.24000E-04	3
Solubility in water (mg/L, 25C):	(20 C) 1900.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.85	3
Partition coefficient, soil/water:	7.8200	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 ORGANO-NITROGENS
CAS #: 924-16-3 N-Nitroso-di-n-butylamine

Other Names: Azo-stat; Azodyne; N-Butyl-N-nitroso-1-butamine; DBN; DBNA; Dibutylnitrosamine; Di-n-butylnitrosamine; N,N-Di-n-butylnitrosamine; N,N-Dibutylnitrosoamine; NDBA; Nitrosodibutylamine; N-Nitrosodibutylamine; N-Butyl-N-nitroso-1-butanamine
Haz Waste #: U172 Ind/EPA Gen #:
Formula: C8H18N2O
Description: Yellow oil; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	158.24	17
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 ORGANO-NITROGENS
CAS #: 1116-54-7 N-Nitrosoethanolamine

Other Names: 2,2'-(Nitrosimino)bisethanol; Diethanolnitrosamine; Bis(beta-hydroxyethyl)nitrosamine; N,N-Diethanolnitrosamine; 2,2'-Dihydroxy-N-nitroso-diethylamine; NCI-C5583; NDEA; NDELA; N-Nitrosoaminodiethanol; Nitrosoimino diethanol; N-Nitrosobis(2-hydroxyethyl)amine; Nitrosodiethanolamine; 2,2'-Nitrosiminodiethanol; Di-(2-ydroxyethyl)nitrosamine
Haz Waste #: U173 Ind/EPA Gen #:
Formula: (HOCH2CH2)2NNO; C4H10N2O3
Description: Light yellow, viscous oil; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	134.13	2
Boiling point (C):	(.01 mm Hg) 125.00	2
Solubility in water (mg/L, 25C):	Miscible	12

August 1987 ORGANO-NITROGENS
CAS #: 55-18-5 N-Nitrosodiethylamine

Other Names: N-Ethyl-N-nitrosoethanamine; DANA; DEN; DENA; NDEA; Diethylnitrosamide; Diethylnitrosamine; N,N-DIethylnitrosamine; Diethylnitrosoamine; Nitrosodiethylamine; N-Nitroso-N,N-diethylamine
Haz Waste #: U174 Ind/EPA Gen #:
Formula: (C2H5)2NNO; C4H10N2O
Description: Slightly yellow liquid; listed as a carcinogen by the EPA (Ref. 2); decomposes in the presence of sunlight; volatile (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	102.14	2
Boiling point (C):	175.00 to 177.00	2
Density (g/cc, 20C):	0.9422	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 ORGANO-NITROGENS
CAS #: 759-73-9 N-Nitroso-N-ethylurea

Other Names: N-Ethyl-N-nitroso-carbamide; ENU; N-Ethyl-N-nitroso-urea; N-Ethyl-N-nitrosourea; 1-Ethyl-1-Nitrosourea; NEU; Ethylnitrosourea; N-Ethylnitrosourea; Nitrosoethylurea; NSC 45403
Haz Waste #: U176 Ind/EPA Gen #:
Formula: C3H7N3O2
Description: Crystal; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	117.11	17
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 ORGANO-NITROGENS
CAS #: 684-93-5 N-Nitroso-N-methylurea

Other Names: N-Methyl-N-nitrosocarbamide; Methylnitrosourea; N-Methyl-N-nitrosourea; 1-Methyl-1-nitrosourea; MNU; Nitrosomethylurea; 1-Nitroso-1-methylurea; NMH; NMU; NSC 23909
Haz Waste #: U177 Ind/EPA Gen #:
Formula: C2H5N3O2
Description: A carcinogen; considered for cancer chemotherapy (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	103.08	17
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 ORGANO-NITROGENS
CAS #: 615-53-2 N-Nitroso-N-methylurethane

Other Names: Methylnitroso carbamic acid, ethyl ester; N-Methyl-N-nitrosoethylcarbamate; Methylnitrosourethan; Ethyl ester of methylnitroso-carbamic acid; N-Methyl-N-nitroso-urethane; Nitrosomethylurethan
Haz Waste #: U178 Ind/EPA Gen #:
Formula: C4H8N2O3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	132.14	14

August 1987 ORGANO-NITROGENS
CAS #: 100-75-4 N-Nitrosopiperidine

Other Names: 1-Nitrosopiperidine; NO-PIP; NPIP
Haz Waste #: U179 Ind/EPA Gen #:
Formula: C5H10N2O
Description: Rapidly decomposed by sunlight; a carcinogen (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	114.15	17

August 1987 ORGANO-NITROGENS
CAS #: 930-55-2 N-Nitrosopyrrolidine

Other Names: 1-Nitrosopyrrolidine; NO-PYR; NPYR;
N-Nitroso-1-pyrrolidinamine
Haz Waste #: U180 Ind/EPA Gen #:
Formula: C4H8N2O
Description: Yellow liquid; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	100.11	2
Boiling point (C):	(2) 104.00 to 106.00	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 ORGANO-NITROGENS
CAS #: 99-55-8 5-Nitrotoluidine

Other Names: 2-Methyl-5-nitrobenzenamine; 2-Methyl-5-nitroaniline;
5-Nitro-o-toluidine
Haz Waste #: U181 Ind/EPA Gen #:
Formula: C7H8N2O2
Description: Yellow prisms

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	152.00	13
Melting point (C):	107.00	13

August 1987 ORGANO-NITROGENS
CAS #: 23950-58-5 Pronamide

Other Names: 3,5-Dichloro-N-(1,1-dimethyl-2-propynyl)benzamide; Propamid;
RH 315; Kerb
Haz Waste #: U192 Ind/EPA Gen #:
Formula: C12H11Cl2NO
Description: White solid; herbicide

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	256.13	2
Melting point (C):	155.00 to 156.00	2
Solubility in water (mg/L, 25C):	15 ppm	2

August 1987 ORGANO-NITROGENS
CAS #: 107-10-8 n-Propylamine

Other Names: 1-Propanamine; Propylamine; 1-Aminopropane
Haz Waste #: U194 Ind/EPA Gen #:
Formula: $CH_3CH_2CH_2NH_2$; C_3H_9N
Description: Colorless, alkaline liquid; strong ammonia odor; strong irritant; possible skin sensitizer (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		59.11	2
Melting point (C):		-83.00	2
Boiling point (C):	155.00 to	156.00	2
Density (g/cc, 20C):		0.7190	2
Solubility in water (mg/L, 25C):		Miscible	2

7.12 Organo-Sulfurs

August 1987 ORGANO-SULFURS
CAS #: 591-08-2 1-Acetyl-2-thiourea

Other Names: N-(Aminothioxomethyl)acetamide
Haz Waste #: P002 Ind/EPA Gen #:
Formula: C3H6N2OS
Description: Needles; severe poison

PHYSICAL PROPERTIES:		Ref.
Melting point (C):	165.00	13

August 1987 ORGANO-SULFURS
CAS #: 108-98-5 Thiophenol

Other Names: Benzenethiol; Phenylmercaptan
Haz Waste #: P014 Ind/EPA Gen #:
Formula: C6-H5SH
Description: Liquid; repulsive, penetrating, garlic-like odor; oxidizes in air (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	110.17	2
Boiling point (C):	168.30	2
Density (g/cc, 20C):	(25 C) 1.0728	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 ORGANO-SULFURS
CAS #: 96-45-7 Ethylene thioruea

Other Names: 2-Imidazolidinethione
Haz Waste #: U116 Ind/EPA Gen #:
Formula: C3H6N2S
Description: Needles, prisms

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	102.17	2
Melting point (C):	203.00 to 204.00	2
Solubility in water (mg/L, 25C):	2 g/100 mL at 30 C	2

August 1987 ORGANO-SULFURS
CAS #: 62-50-0 Ethyl methanesulfonate

Other Names: Methanesulfonic acid ethyl ester; Ethyl methanesulfonic acid; ethyl mesylate; EMS; NSC 26805
Haz Waste #: U119 Ind/EPA Gen #:
Formula: CH3SO2OCH2CH3
Description: Liquid; used experimentally as a mutagen

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	124.15	2
Boiling point (C):	213.00 to 213.50	2
Density (g/cc, 20C):	(22 C) 1.1452	2

August 1987 ORGANO-SULFURS
CAS #: 74-93-1 Methyl mercaptan

Other Names: Methanethiol; Mercaptomethane; Thiomethyl alcohol; Methyl sulfhydrate
Haz Waste #: U153 Ind/EPA Gen #:
Formula: CH3SH; CH4S
Description: Flammable gas; odor of rotten cabbage (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		48.11	2
Melting point (C):		-123.00	3
Boiling point (C):		5.95	3
Density (g/cc, 20C):		0.8665	2
Vapor pressure (torr, 25C):		1500.00	3
Henry's law!const (atm m**3/mol, 25C):		0.38500E-02	3
Solubility in water (mg/L, 25C):	(20 C)	0.23330E+05	3

August 1987 ORGANO-SULFURS
CAS #: 1120-71-4 1,3-Propane sulfone

Other Names: 2,2-Dioxide-1,2-oxathiolane
Haz Waste #: U193 Ind/EPA Gen #:
Formula: C3H6O3S

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	122.14	17

August 1987 ORGANO-SULFURS
CAS #: 62-55-5 Thioacetamide

Other Names: Ethanethioamide
Haz Waste #: U218 Ind/EPA Gen #:
Formula: CH3CSNH2; C2H5NS
Description: Crystals; slight odor of mercaptans

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		75.14	2
Melting point (C):	113.00 to	114.00	2
Solubility in water (mg/L, 25C):		16.3 g/100 mL	2

August 1987 ORGANO-SULFURS
CAS #: 62-56-6 Thiourea

Other Names: Thiocarbamide; Thiocarbonic diamide
Haz Waste #: U219 Ind/EPA Gen #:
Formula: H2NCSNH2; CH4N2S
Description: Rhombohedron or needles; experimental carcinogen (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	76.00	13
Melting point (C):	180.00	13
Solubility in water (mg/L, 25C):	Soluble	13

7.13 Halogenated N.O.S.

August 1987 HALOGENATED N.O.S.
CAS #: 598-31-2 Bromoacetone

Other Names: Bromo-2-propanone
Haz Waste #: P017 Ind/EPA Gen #:
Formula: CH3COCH2Br
Description: Liquid; violent lacrimator

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	136.99	2
Melting point (C):	-36.50	2
Boiling point (C):	137.00	2
Density (g/cc, 20C):	(23 C) 1.6340	2
Vapor pressure (torr, 25C):	0.00000E+00	2
Henry's law const (atm m**3/mol, 25C):	0.00000E+00	2
Solubility in water (mg/L, 25C):	Sparingly soluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 107-20-0 Chloroacetaldehyde

Other Names: 2-Chloro-1-ethanal; monochloroacetaldehyde
Haz Waste #: P023 Ind/EPA Gen #:
Formula: ClCH2CHO
Description: Liquid; acrid, penetrating odor; very corrosive to mucous membranes; intensely irritating to eyes, skin.

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	78.50	2
Boiling point (C):	(760 mm Hg) 85.00 to 6.00	2

August 1987 HALOGENATED N.O.S.
CAS #: 106-47-8 p-Chloroaniline

Other Names: 4-Chlorobenzenamine
Haz Waste #: P024 Ind/EPA Gen #:
Formula: C6H6ClN
Description: Orthorhombic crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	127.57	2
Melting point (C):	72.50	2
Boiling point (C):	232.00	2
Density (g/cc, 20C):	(liquid, 77 C) 1.1690	2
Solubility in water (mg/L, 25C):	Soluble in hot water	2

August 1987 HALOGENATED N.O.S.
CAS #: 53-86-1 Indomethacin

Other Names: 1-(4-Chlorobenzoyl)-5-methoxy-2-methyl-1H-indole-3-acetic acid; 1-(p-Chlorobenzoyl)-5-methoxy-2-methyl-3-indolylacetic acid; Amuno; Artacin; Artinovo; Artrivia; Confortid; Idomethine; Imbrilon; Inacid; Indacin; Indocid; Indocin; Indomed; Indomee; Indoptic; Indo-Tablinen; Inflazon; Infrocin; Inteban SP; Lausit; Mezolin; Mikametan; Mobilan; Tannex
Haz Waste #: P025 Ind/EPA Gen #:
Formula: C19H16ClNO4
Description: Crystals exhibiting polymorphism

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	357.81	2
Melting point (C):	One crystalline form melts about 155., another about 162.	2
Solubility in water (mg/L, 25C):	Practically insoluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 5344-82-1 1-(o-Chlorophenyl)thiourea

Other Names: 2-Chlorophenyl thiourea
Haz Waste #: P026 Ind/EPA Gen #:
Formula: C7H7ClN2S

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	186.67	14

August 1987 HALOGENATED N.O.S.
CAS #: 542-76-7 3-Chloropropionitrile

Other Names: beta-Chloropropionitrile; 3-Chloropropanenitrile; 3-Chloropropanonitrile
Haz Waste #: P027 Ind/EPA Gen #:
Formula: ClCH2CH2CN
Description: Liquid; acrid, characterisitic odor; poisonous; readily penetrates skin to produce systemic cyanide poisoning, death (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	89.53	2
Melting point (C):	-51.00	2
Boiling point (C):	(decomposes) 176.00	2
Density (g/cc, 20C):	(25 C) 1.1363	2
Vapor pressure (torr, 25C):	0.00000E+00	2
Henry's law const (atm m**3/mol, 25C):	0.00000E+00	2
Solubility in water (mg/L, 25C):	4.5 g/100 mL	2

August 1987 HALOGENATED N.O.S.
CAS #: 100-44-7 Benzyl chloride

Other Names: (Chloromethyl)benzene; alpha-Chlorotoluene
Haz Waste #: P028 Ind/EPA Gen #: K015
Formula: C6H5CH2Cl
Description: Very refractive liquid; rather unpleasant, irritating odor; intensely irritating to skin, eyes, mucous membranes; large doses can cause CNS depression (Ref. 2); suspected carcinogen (Ref. 12)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		126.58	2
Melting point (C):	-43.00 to	-48.00	3
Boiling point (C):		179.00	3
Density (g/cc, 20C):		1.1000	2
Vapor pressure (torr, 25C):	(22 C)	1.0000	3
Henry's lawwconst (atm m**3/mol, 25C):		0.52200E-03	3
RETENTION PROPERTIES:			Ref.
Hydrolysis rate, water (1/month, 25C):		0.02	15

August 1987 HALOGENATED N.O.S.
CAS #: 75-44-5 Phosgene

Other Names: Carbonyl chloride; Carbonic dichloride; Chloroformyl chloride
Haz Waste #: P095 Ind/EPA Gen #:
Formula: Cl2C=O
Description: Colorless, highly toxic gas; suffocating odor; insidious poison as it is not irritating immediately, even when fatal concentrations are inhaled (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		98.92	3
Melting point (C):		-118.00	3
Boiling point (C):		8.10	3
Density (g/cc, 20C):	(0 C; clear, colorless, fuming liquid)	1.4320	2
Vapor pressure (torr, 25C):	(20 C)	1220.00	3
Solubility in water (mg/L, 25C):		Decomposes	3
RETENTION PROPERTIES:			Ref.
Hydrolysis rate, water (1/month, 25C):		Rapid	3

August 1987 HALOGENATED N.O.S.
CAS #: 594-42-3 Trichloromethanethiol

Other Names: Trichloromethanesulfenyl chloride; Perchloromethanethiol; Thiocarbonyl tetrachloride
Haz Waste #: P118 Ind/EPA Gen #:
Formula: Cl3CSCl; CCl4S
Description: Pale yellow oil; highly toxic; irritant; decomposes above 200 C (Ref. 13)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	186.00	13
Boiling point (C):	149.00	13
Density (g/cc, 20C):	1.6900	13

August 1987 HALOGENATED N.O.S.
CAS #: 98-87-3 Benzal chloride

Other Names: (Dichloromethyl)benzene; Benzylidene chloride; Benzyl dichloride; alpha,alpha-Dichlorotoluene; Benzylene chloride
Haz Waste #: U017 Ind/EPA Gen #:
Formula: C6H5CHCl2; C7H6Cl2
Description: Very refractive liquid; fumes in air; vapors irritate the eyes; pungent odor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	161.03	2
Melting point (C):	-17.00	2
Boiling point (C):	205.00	2
Density (g/cc, 20C):	1.2600	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 111-91-1 bis-(2-chloroethyoxy)methane

Other Names: Dichlorodiethyl methylal
Haz Waste #: U024 Ind/EPA Gen #:
Formula: (ClCH2CH2O)2CH2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	173.10	3
Melting point (C):	-32.80	3
Boiling point (C):	218.00	3
Vapor pressure (torr, 25C):	<0.1 (20 C)	3
Henry's law const (atm m**3/mol, 25C):	0.37800E-06	3
Solubility in water (mg/L, 25C):	(? C) 0.81000E+05	3

RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.26	3
Partition coefficient, soil/water:	2.2900	17
Hydrolysis rate, water (1/month, 25C):	Slowwhydrolysis	3
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 111-44-4 bis(2-chloroethyl)ether

Other Names: Dichloroethyl ether; bis(beta-chloroethyl)ether
Haz Waste #: U025 Ind/EPA Gen #:
Formula: (ClCH2CH2)2O

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	143.00	3
Melting point (C):	-46.80	3
Boiling point (C):	178.00	3
Vapor pressure (torr, 25C):	(20 C) 0.7100	3
Henry's law const (atm m**3/mol, 25C):	0.21600E-04	3
Solubility in water (mg/L, 25C):	0.10200E+05	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.58	3
Partition coefficient, soil/water:	4.4600	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 494-03-1 N,N-Bis(2-chloroethyl)-2-naphthylamine

Other Names: Chlornaphazine; Dichloroethyl-beta-naphthylamine; CB 1048
beta-Naphthyldi(2-chloroethyl)amine; R48; Clornaftina;
beta-Naphthylbis(beta-chloroethyl)amine; Erysan;
Di(2-chloroethyl)-b-naphthylamine
Haz Waste #: U026 Ind/EPA Gen #:
Formula: C14H15Cl2N
Description: Platelets; can produce bladder tumors; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	268.20	2
Melting point (C):	54.00 to 56.00	2
Boiling point (C):	(5 mm Hg) 210.00	2
Solubility in water (mg/L, 25C):	Very sparingly soluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 108-60-1 bis-(2-chloroisopropyl)ether

Other Names: 2,2'-Dichloroisopropyl ether
Haz Waste #: U027 Ind/EPA Gen #:
Formula: (ClCH2CH(CH3))2O

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	171.00	3
Melting point (C):	-97.00	3
Boiling point (C):	189.00	3
Vapor pressure (torr, 25C):	(20 C) 0.8500	3
Henry's law const (atm m**3/mol, 25C):	0.15300E-03	3
Solubility in water (mg/L, 25C):	(? C) 1700.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	2.58	3
Partition coefficient, soil/water:	35.7500	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Rapid	3

August 1987 HALOGENATED N.O.S.
CAS #: 74-83-9 Bromomethane

Other Names: Methyl bromide; Monobromomethane; Embafume
Haz Waste #: U029 Ind/EPA Gen #:
Formula: CH3Br
Description: Colorless gas; usually odorless; burning taste; non-flammable in air; forms a hydrate below 4 C; inhalation causes dizziness, hadache, nausea, etc. leading to death; chronich exposure can cause CNS depression or kidney injury (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	94.94	3
Melting point (C):	-93.66	2
Boiling point (C):	4.60	3
Density (g/cc, 20C):	(g/L, gas) 3.9740	2
Vapor pressure (torr, 25C):	(20 C) 1420.00	3
Henry's law const (atm m**3/mol, 25C):	0.2200	3
Solubility in water (mg/L, 25C):	(20 C) 900.00	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	1.10	3
Partition coefficient, soil/water:	1.6400	17
Hydrolysis rate, water (1/month, 25C):	8232.00	15

August 1987 HALOGENATED N.O.S.
CAS #: 101-55-3 4-Bromophenal phenyl ether

Other Names: 1-Bromo-4-phenoxy benzene; 4-Bromophenyl ether
Haz Waste #: U030 Ind/EPA Gen #:
Formula: C6H5OC6H4Br

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	249.10	3
Melting point (C):	18.70	3
Boiling point (C):	310.00	3
Vapor pressure (torr, 25C):	(20 C) 0.15000E-02	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	4.28	3
Partition coefficient, soil/water:	1235.00	17
Hydrolysis rate, water (1/month, 25C):	Not significant	3
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED N.O.S
CAS #: 353-50-4 Carbonyl fluoride

Other Names: Carbon oxyfluoride; Carbonyl difluoride; Fluophosgene
Haz Waste #: U033 Ind/EPA Gen #:
Formula: COF2; CF2O
Description: Pungent, very hygroscopic gas; strong irritant to skin, eyes, mucous membranes, respiratory tract (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	66.01	2
Melting point (C):	-114.00	2
Boiling point (C):	-83.10	2
Density (g/cc, 20C):	(liquid, -114 C) 1.1390	2
RETENTION PROPERTIES:		Ref.
Hydrolysis rate, water (1/month, 25C):	Hydrolyzes instantly	2

August 1987 HALOGENATED N.O.S.
CAS #: 75-87-6 Trichloroacetaldehyde

Other Names: Chloral; Anhydrous chloral
Haz Waste #: U034 Ind/EPA Gen #:
Formula: Cl3CCHO; C2HCl3O
Description: Oily liquid; pungent, irritating odor; abuse may lead to addiction

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	147.40	2
Melting point (C):	-57.50	2
Boiling point (C):	97.80	2
Density (g/cc, 20C):	1.5100	2
Solubility in water (mg/L, 25C):		
	Freely soluble forming chloral hydrate	2

August 1987 HALOGENATED N.O.S.
CAS #: 305-03-3 Chlorambucil

Other Names: Ambochlorin; 4-[Bis(2-chloroethyl)amino]benzenebutanoic acid; 4-[p-[Bis(2-chloroethyl)amino]phenyl]butyric acid; gamma-[p-di(2-Chloroethyl)aminophenyl]butyric acid; N,N-di-2-Chloroethyl-gamma-p-aminophenylbutyric acid; Chloraminophene; CB 1348; Amboclorin; Leukeran; Amboclorin; Chlorbutin; Bhlorbutine; Ecloril; Elcoril; Linfolizin; Linfolysin; NCI-C03485; NSC-3088; Chloraminophen; Phenylbutyric acid nitrogen mustard; Leukersan; Leukoran
Haz Waste #: U035 Ind/EPA Gen #:
Formula: C14H19Cl2NO2
Description: Flattened needles; listed as a carcinogen by the EPA; used in cancer chemotherapy

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	304.23	2
Melting point (C):	64.00 to 66.00	2

August 1987 HALOGENATED N.O.S.
CAS #: 124-48-1 Chlorodibromomethane

Other Names: Dibromochloromethane
Haz Waste #: U040,U065 Ind/EPA Gen #:
Formula: CHClBr2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	208.30	3
Melting point (C):	< -20	3
Boiling point (C):	119.00 to 120.00	3
Vapor pressure (torr, 25C):	(10.5 C) 15.0000	3
Henry's law const (atm m**3/mol, 25C):	0.78300E-03	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	2.09	3
Partition coefficient, soil/water:	13.1300	17
Hydrolysis rate, water (1/month, 25C):	3283.00	15
Biodegradation rate in water (1/month):	Not significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 106-89-8 1-Chloro-2,3-epoxypropane

Other Names: Epichlorohydrin; Chloromethyloxirane;
dl-alpha-Epichlorohydrin; gamma-Chloropropylene oxide
Haz Waste #: U041 Ind/EPA Gen #: K017
Formula: C3H5ClO
Description: Liquid; strong skin irritant; chronic exposure can cause kidney damage (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	92.53	2
Melting point (C):	-25.60	2
Boiling point (C):	117.90	2
Density (g/cc, 20C):	1.1812	2
Solubility in water (mg/L, 25C):	Insoluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 110-75-8 2-Chloroethyl vinyl ether

Other Names: Vinyl 2-chloroethyl ether
Haz Waste #: U042 Ind/EPA Gen #:
Formula: ClCH2CH2OCH=CH2

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	106.60	3
Melting point (C):	-69.70	3
Boiling point (C):	108.00	3
Vapor pressure (torr, 25C):	(20 C) 26.7500	3
Henry's law const (atm m**3/mol, 25C):	0.21600E-04	3
Solubility in water (mg/L, 25C):	(? C) 0.15000E+05	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.28	3
Partition coefficient, soil/water:	2.4300	17
Hydrolysis rate, water (1/month, 25C):	Minor hydrolysis, if adsorbed	3
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 75-01-4 Vinyl chloride

Other Names: Chloroethylene; Airex; Armodour; Astralon; Bakelite; Benvic; Boltaron; Bonloid; Breon; Caliplast; Carina; Chlorethene; Chlorethylene; Chloroethene; Chlorostop; Conoco 5385; Conoco 5425; Conoco 7200; Contizell; Dacovin; Daran; Darvic; Daycell; Cecatone; Cecelith H; Diamond Shamrock 40; Diamond Shamrock 71; 1,1-Dichloroethene polymer with chlorethene; Dorlyl; Dow latex 874; Dow 874; Duraform; Durvyl; Dynadur; E-PVC; Esteproz; Flocor; Flovic; Genotherm; Geon; Kaylite; Klegecell; Koroseal; Laplen; Latex SVKH; Marvinal; Marvinol; Norvinyl; Opalon; PVC; Vinyon; Vinoflex; (many more)
Haz Waste #: U043 Ind/EPA Gen #: K020
Formula: CH2=CHCl; C2H3Cl
Description: Colorless gas, flammable, polymerizes in light or in presence of catalyst (Ref. 1); causes "vinyl chloride disease"; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	62.50	2
Melting point (C):	-153.80	2
Boiling point (C):	-13.37	2
Vapor pressure (torr, 25C):	2660.00	3
Henry's law const (atm m**3/mol, 25C):	0.0360	3
Solubility in water (mg/L, 25C):	1.1000	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	0.60	3
Partition coefficient, soil/water:	0.5900	17

August 1987 HALOGENATED N.O.S.
CAS #: 74-87-3 Chloromethane

Other Names: Methyl chloride
Haz Waste #: U045 Ind/EPA Gen #:
Formula: CH3Cl
Description: Colorless gas; compresses to a colorless liquid of ethereal odor and sweet taste; poisonous; injury to liver, kidneys, CNS may occur; used as a refrigerant and local anesthetic (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	50.49	2
Melting point (C):	-97.70	3
Boiling point (C):	-24.20	3
Vapor pressure (torr, 25C):	(20 C) 3765.00	3
Henry's lawwconst (atm m**3/mol, 25C):	0.0368	3
Solubility in water (mg/L, 25C):	6450.00 to 7250.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	0.91	3
Partition coefficient, soil/water:	1.1300	17
Hydrolysis rate, water (1/month, 25C):	Slow hydrolysis	3
Biodegradation rate in water (1/month):	Not important	3

August 1987 HALOGENATED N.O.S.
CAS #: 107-30-2 Chloromethyl methyl ether

Other Names: Chloromethoxymethane; Methyl chloromethyl ether; Monochloromethyl methyl ether; Chlorodimethyl ether; CMME; alpha-alpha-Dichlorodimethyl ether; Methoxychloromethane; Methoxymethyl chloride; Monochlorodimethyl ether
Haz Waste #: U046 Ind/EPA Gen #:
Formula: CH3OCH2Cl; C2H5ClO
Description: Colorless liquid; technical grade listed as a carcinogen by the EPA (Ref. 2); technical grade contains 1-8% BCME (Bis(chloromethyl)ether; CAS#542-88-1) (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	80.51	2
Boiling point (C):	59.00	2
Density (g/cc, 20C):	1.0605	2
Solubility in water (mg/L, 25C):	Soluble	12

August 1987 HALOGENATED N.O.S.
CAS #: 91-58-7 2-Chloronaphthalene

Other Names: Beta-chloronaphthalene
Haz Waste #: U047 Ind/EPA Gen #:
Formula: C10H7Cl
Description: Monoclinic plates, leaflets

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	162.61	2
Melting point (C):	61.00	3
Boiling point (C):	256.00	3
Vapor pressure (torr, 25C):	(20 C) 0.0170	3
Henry's law const (atm m**3/mol, 25C):	0.61200E-03	3
Solubility in water (mg/L, 25C):	6.7400	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	4.12	3
Partition coefficient, soil/water:	882.00	17
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 3165-93-3 4-Chloro-o-toluidine hydrochloride

Other Names: 4-Chloro-2-methyl benzenamine hydrochloride
Haz Waste #: U049 Ind/EPA Gen #:
Formula: C7H8ClN.ClH

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	178.06	17

August 1987 HALOGENATED N.O.S.
CAS #: 106-93-4 1,2-Dibromoethane

Other Names: Ethylene dibromide; Aadibroom; Bromofume; Celmide; DBE; Dibromoethane; alpha,beta-Dibromoethane; sym-Dibromoethane; Dowfume EDB; Dowfume W 85; E-D-Bee; EDB; EDB-85; ENT 15349; Ethylene bromide; Fumo-gas; Glycol bromide; Iscobrome D; Glycol dibromide; Kopfume; NCI-C00522; Nefis; Nephis; Pestmaster; Sanhyuum; Soilbrom; Soilbrome-85; Soilfume; Unifume; Soilbrom-90EC; Soilbrom-40; Dowfume 40
Haz Waste #: U067 Ind/EPA Gen #:
Formula: BrCH2CH2Br; C2H4Br2
Description: Heavy liquid; chloroform odor; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	187.90	3
Melting point (C):	9.97	3
Boiling point (C):	132.00	3
Density (g/cc, 20C):	(25 C) 2.1720	2
Vapor pressure (torr, 25C):	(20 C) 11.0000	3
Henry's law const (atm m**3/mol, 25C):	0.88200E-03	3
Solubility in water (mg/L, 25C):	(30 C) 4310.00	3

August 1987 HALOGENATED N.O.S.
CAS #: 74-95-3 Dibromomethane

Other Names: Methylene bromide
Haz Waste #: U068 Ind/EPA Gen #:
Formula: CH2Br2
Description: Liquid

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	173.86	2
Melting point (C):	-52.70	2
Boiling point (C):	97.00	2
Density (g/cc, 20C):	2.4956	2
Solubility in water (mg/L, 25C):	11.93 g/kg, 30 C	2
RETENTION PROPERTIES:		**Ref.**
Hydrolysis rate, water (1/month, 25C):	2196.00	15

August 1987 HALOGENATED N.O.S.
CAS #: 91-94-1 3,3'-Dichlorobenzidine

Other Names: C.I. 23060; Curithane C 126; O,O'-Dichlorobenzidine;
4,4'-Diamino-3,3'-dichlorobiphenyl; Dichlorobenzidine base;
3,3'-Dichloro-4,4'-Diaminobiphenyl; Dichlorobenzidine; DCB
Haz Waste #: U073 Ind/EPA Gen #:
Formula: H2N(Cl)C6H3-C6H3NH2(Cl); C12H10Cl2N2
Description: Needles; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	253.10	3
Melting point (C):	132.00	3
Solubility in water (mg/L, 25C):	12.3000	10
RETENTION PROPERTIES:		**Ref.**
Hydrolysis rate, water (1/month, 25C):	Hydrolysis not important	3
Biodegradation rate in water (1/month):	May degrade	3

August 1987 HALOGENATED N.O.S.
CAS #: 75-09-2 Methylene chloride

Other Names: Dichloromethane; Methylene dichloride; Methylene bichloride
Haz Waste #: U080 Ind/EPA Gen #: F001,F002
Formula: CH2Cl2
Description: Colorless liquid; vapor not flammable (Ref. 1)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	84.94	2
Melting point (C):	-96.70	1
Boiling point (C):	39.75	2
Density (g/cc, 20C):	specific gravity 1.3200	1
Vapor pressure (torr, 25C):	362.00	3
Henry's law const (atm m**3/mol, 25C):	0.31900E-02	3
Solubility in water (mg/L, 25C):	0.16700E+05	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.25	3
Partition coefficient, soil/water:	2.2400	17
Hydrolysis rate, water (1/month, 25C):	8448.00	15
Biodegradation rate in water (1/month):	Significant	3

August 1987 HALOGENATED N.O.S.
CAS #: 148-82-3 Melphalan

Other Names: 4-[Bis(2-chloroethyl)amino]-L-phenylalanine; L-PAM; p-Di(2-chloroethyl)amino-L-phenylalanine; Melfalan; L-phenylalanine mustard; Alanine nitrogen mustard; L-Sarcolysine; NSC-8806; CB 3025; Alkeran; Sarcoclorin; AT-290; L-3-(p-(bis(2-chloroethyl)amino)phenyl)alanine; p-N-Bis(2-chloroethyl)amino-L-phenylalanine; 3025 C.B.; 3-(p-(Bis(2-chloroethyl)amino)phenyl)-L-alanine; L-PAM; Levofalan; Mel; Phenylalanine mustard; p-L-Sarcolysin; L-Sarcolysin; Sarcolysine; Sarkolysin; SK-15673; Phenylalanine nitrogen mustard; L-Sarkolysin
Haz Waste #: U150 Ind/EPA Gen #:
Formula: C13H18Cl2N2O2
Description: Needles; listed as a carcinogen by the EPA; bone marrow depression may occur (Ref. 2); used in cancer chemotherapy

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	305.20	2
Melting point (C):	(decomposes) 182.00 to 183.00	2
Solubility in water (mg/L, 25C):	Practically insoluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 79-22-1 Methyl Chlorocarbonate

Other Names: Carbonochloridic acid, methyl ester; Methyl chloroformate
Haz Waste #: U156 Ind/EPA Gen #:
Formula: ClCO2CH3; C2H3ClO2
Description: Clear liquid; vapors strongly irritating to eyes (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	94.50	2
Boiling point (C):	71.00	2
Density (g/cc, 20C):	1.2230	2
Solubility in water (mg/L, 25C):	Slightly soluble; decomposes	2

August 1987 HALOGENATED N.O.S.
CAS #: 101-14-4 4,4'-Methylenebis[2-chloroaniline]

Other Names: 4,4'-Methylenebis[2-chlorobenzenamine]; MOCA; DACPM; 4,4'-Diamino-3,3'-dichloro-diphenylmethane; di-4-(Amino-3-chlorophenyl)methane; Methylenebis(o-chloroaniline)
Haz Waste #: U158 Ind/EPA Gen #:
Formula: C13H12Cl2N2
Description: Flakes

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	267.15	2
Melting point (C):	110.00	2
Solubility in water (mg/L, 25C):	Slightly soluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 608-93-5 Pentachlorobenzene

Haz Waste #: U183 Ind/EPA Gen #:
Formula: 1,2,3,4,5-C6HCl5

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	250.30	3
Melting point (C):	85.00	1
Boiling point (C):	276.00	1
Vapor pressure (torr, 25C):	(kPa) 0.88900E-02	3
Henry's law const (atm m**3/mol, 25C):	(kPa m**3/mol) 0.9770	3
Solubility in water (mg/L, 25C):	(g/m**3) 0.5600	3

August 1987 HALOGENATED N.O.S.
CAS #: 76-01-7 Pentachloroethane

Other Names: Pentalin
Haz Waste #: U184 Ind/EPA Gen #:
Formula: CCl3CHCl2; C2HCl5
Description: Liquid; chloroform-like odor; irritant; narcotic (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		202.31	2
Melting point (C):		-29.00	2
Boiling point (C):	161.00 to	162.00	2
Density (g/cc, 20C):	(25 C)	1.6712	2
Solubility in water (mg/L, 25C):		Insoluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 95-94-3 1,2,4,5-Tetrachlorobenzene

Haz Waste #: U207 Ind/EPA Gen #: K085,K042
Formula: 1,2,4,5-C6H2Cl4

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		215.90	1
Melting point (C):		140.00	3
Boiling point (C):		243.00	3
Density (g/cc, 20C):	(kg/L, liquid)	1.8330	1
Vapor pressure (torr, 25C):	(kPa)	0.0101	3
Henry's law const (atm m**3/mol, 25C):	(kPa m**3/mol)	0.2610	3
Solubility in water (mg/L, 25C):	(g/m**3)	0.5950	3

August 1987 HALOGENATED N.O.S.
CAS #: 66-75-1 Uracil mustard

Other Names: 5-[Bis(2-chloroethyl)amino]-2,4-(1H,3H)-pyrimidinedione;
5-[Bis(2-chloroethyl)amino]uracil; Uramustine;
2,6-Dihydroxy-5-bis[2-chloroethyl]aminopyramidine;
5-[di-(beta-chloroethyl)amino]uracil; Demethyldopan;
Desmethyldopan; NSC-34462; U-8344
Haz Waste #: U237 Ind/EPA Gen #:
Formula: C8H11Cl2N3O2
Description: Crystals

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		252.10	2
Melting point (C):	(decomposes)	206.00	2
Solubility in water (mg/L, 25C):		Sparingly soluble	2

August 1987 HALOGENATED N.O.S.
CAS #: 120-82-1 1,2,4-Trichlorobenzene

Other Names: unsym-Trichlorobenzene
Haz Waste #: X015 Ind/EPA Gen #: K085
Formula: 1,2,4-C6H3Cl3

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	181.45	1
Melting point (C):	17.15	1
Boiling point (C):	213.80	1
Density (g/cc, 20C):	(liquid) 1.4483	1
Vapor pressure (torr, 25C):	0.4200	3
Henry's law const (atm m**3/mol, 25C):	0.14200E-02	3
Solubility in water (mg/L, 25C):	30.0000	3
RETENTION PROPERTIES:		Ref.
log (octanol/water) partition (25C):	4.26	3
Partition coefficient, soil/water:	1180.00	17
Biodegradation rate in water (1/month):	Bioaccumulates	3

7.14 Pharmaceuticals

August 1987 PHARMACEUTICALS
CAS #: 2763-96-4 5-(Aminomethyl)-3-isoxazolol

Other Names: Muscimol; 5-(Aminomethyl)-3(2H)-isoxazolone; 5-Aminomethyl-3-hydroxy-isoxazole; 3-Hydroxy-5-aminomethylisoxazole; Agarin; Pantherine
Haz Waste #: P007 Ind/EPA Gen #:
Formula: C4H6N2O2
Description: Crystals; potent CNS depressant and GABA antagonist (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		114.10	2
Melting point (C):	decomposes	175.00	2

August 1987 PHARMACEUTICALS
CAS #: 504-24-5 4-Aminopyridine

Other Names: 4-Pyridinamine; gamma-Pyridylamine
Haz Waste #: P008 Ind/EPA Gen #:
Formula: C5H6N2
Description: Crystals; highly toxic (Ref. 13)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		94.00	13
Melting point (C):		158.00	13
Boiling point (C):	(12 mm Hg)	180.00	13

August 1987 PHARMACEUTICALS
CAS #: 51-43-4 Epinephrine

Other Names: 4-[1-Hydroxy-2-(methylamino)ethyl]-1,2-benzenediol; 3,4-Dihydroxy-alpha-[(methylamino)methyl]benzyl alcohol; 1-(3,4-dihydroxyphenyl)-2-(methylamino)ethanol; 3-4-dihydroxy-1-[1-hydroxy-2-(methylamino)-ethyl]benzene; Methylaminoethanolcatechol; Adrenalin
l-Form--Adnephrine; Adrena; Adrenamine; Adrenine; Adrin; Epinephran; Epirenan; Hemostasin; Renaleptine; Renalina; Suprarenaline; Surrenine; Vasoconstrictine; etc.
Haz Waste #: P042 Ind/EPA Gen #:
Formula: C9H13NO3
Description: l-Form occurs naturally (described here); minute crystals; combines with acids forming water soluble salts; solutions undergo oxidation (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		183.20	2
Melting point (C):	211.-212.; approx. 215. (decomposes) when heated rapidly		2
Solubility in water (mg/L, 25C):	Sparingly soluble		2

August 1987 PHARMACEUTICALS
CAS #: 115-02-6 Azaserine

Other Names: L-Serine diazoacetate(ester); O-Diazo-acetyl-L-serine; C1 337; CN 15757; P 165
Haz Waste #: U015 Ind/EPA Gen #:
Formula: N2CHCOOCH2CH(NH2)COOH; C5H7N3O4
Description: Orthorhombic, pale yellow to green crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	173.13	2
Melting point (C):	(decomposes) 146.00 to 162.00	2
Solubility in water (mg/L, 25C):	Very soluble	2

August 1987 PHARMACEUTICALS
CAS #: 20830-81-3 Daunomycin

Other Names: 8-Acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-5,12-naphtacenedione; Daunorubicin; Rubidomycin; Leukaemomycin C; Cerubidin
Haz Waste #: U059 Ind/EPA Gen #:
Formula: C27H29NO10

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	527.53	17

August 1987 PHARMACEUTICALS
CAS #: 56-53-1 Diethylstilbestrol

Other Names: 4,4'-(1,2-Diethyl-2,3-ethenediyl)bisphenol; alpha,alpha'-Diethylstilbenediol; Stilbestrol; 3,4-bis(p-hydroxyphenyl)-3-hexene; 4,4'-dihydroxy-alpha,beta-diethylstilbene; DES; Antigestil; Bio-des; Bufon; Cyren A; Distilbene; Domestrol; Estrobene; Estrosyn; Fonatol; Grafestrol; Hi-Bestrol; Makarol; Micrest; Milestrol; Neo-Oestranol I; Oestrogenine; Oestromenin; Oestromensyl; Oestromon; Palestrol; Serral; Sexocretin; Sibol; Stilbetin; Stilboefral; Stilboestroform; Stilkap; Synestrin (tablets); Synthoestrin; Vagestrol; Acnestrol; Agostilben; DEB; DESMA; (many more)
Haz Waste #: U089 Ind/EPA Gen #:
Formula: C18H20O2
Description: Small plates; banned by the FDA in 1979 as a growth promotant in livestock; listed as a carcinogen by the EPA; used to prevent miscarriage in humans; an estrogen (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	268.34	2
Melting point (C):	169.00 to 172.00	2
Solubility in water (mg/L, 25C):	Almost insoluble	2

August 1987 PHARMACEUTICALS
CAS #: 94-58-6 Dihydrosafrole

Other Names: 1,2-(Methylenedioxy)-4-propylbenzene;
5-Propyl-1,3-benzodioxole;
4-Propyl-1,2-methylenedioxybenzene
Haz Waste #: U090 Ind/EPA Gen #:
Formula: C10H12O2
Description: Oily liquid

PHYSICAL PROPERTIES:		Ref
Molecular weight:	164.22	14
Boiling point (C):	228.00	14
Density (g/cc, 20C):	1.0695	14

August 1987 PHARMACEUTICALS
CAS #: 120-58-1 Isosafrole

Other Names: 5-(1-Propenyl)-1,3-benzodioxole; 1,2-(Methylenedioxy)-4-propenylbenzene
Haz Waste #: U141 Ind/EPA Gen #:
Formula: C10H10O2
Description: Liquid; trans-form--odor of anise (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	162.18	2
Melting point (C):	trans--8.2; cis-- -21.5	2
Boiling point (C):	trans--253.; cis--77. to 79. at 3.5 mm Hg	2
Density (g/cc, 20C):	trans--1.1206; cis--1.1182	2

August 1987 PHARMACEUTICALS
CAS #: 303-34-4 Lasiocarpine

Other Names: 2-Methyl-2-butenoic acid 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester
Haz Waste #: U143 Ind/EPA Gen #:
Formula: C21H33NO7
Description: Colorless leaflets

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	411.40	2
Melting point (C):	94.00 to 95.50	2
Solubility in water (mg/L, 25C):	Difficultly soluble	2

August 1987 PHARMACEUTICALS
CAS #: 70-25-7 N-Methyl-N'-nitro-N-nitrosoguanidine

Other Names: N-Nitroso-N-methyl-N'-nitro-guanidine; N-Methyl-N-nitroso-N'-nitroguanidine; MNNG
Haz Waste #: U163 Ind/EPA Gen #:
Formula: C2H5N5O3
Description: Yellow crystals; carcinogen and mutagen (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	147.10	2
Melting point (C):	(decomposes) 118.00	2

August 1987 PHARMACEUTICALS
CAS #: 56-04-2 Methylthiouracil

Other Names: 2,3-Dihydro-6-methyl-2-thioxo-4(1H)-pyrimidinone; 6-methyl-2-thiouracil; 4-methyl-2-thiouracil; MTU; Alkiron; Antibason; Basecil; Basethyrin; Methiacil; Methicil; Methiocil; Muracil; Prostrumyl; Strumacil; Thimecil; Thyreostat I
Haz Waste #: U164 Ind/EPA Gen #:
Formula: C5H6N2OS
Description: Crystals; bitter taste; thyroid inhibitor (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	142.18	2
Melting point (C):	(decomposes, sublimes readily) 326.00 to 331.00	2
Solubility in water (mg/L, 25C):	Very slightly soluble; 1 part in 150 at 100 C	2

August 1987 PHARMACEUTICALS
CAS #: 62-44-2 Phenacetin

Other Names: N-(4-Ethoxyphenyl)acetamide; p-Acetophenetidide; p-Ethoxyacetanilide; Acetophenetidin; para-Acetphenetidin; Acet-p-phenetidin; p-Acetophenetide; Acet-p-phenalide; 1-Acetamido-4-ethoxybenzene; Aceto-para-phenalide; Anapac; APC; Bromo seltzer; Buff-a-comp; Citra-fort; Contradol; Dasin; Empiral; Empirin compound; Malex; Gelonida; Pamprin; Norgesic; Sinutab; Sinutab II; Soma; Phenin; Phenodyne; Tetracydin; Viden; Wigraine; Xaril; Zactirin compound; Terracydin; Super anahist; Supralgin; Synalogos; Reformin; Phenazetin; Phenacon; Pehnaphen; Phenacet; (many more)
Haz Waste #: U187 Ind/EPA Gen #:
Formula: Slightly bitter cyrstalline scales or powder; listed as a
Description: carcinogen by the EPA (Ref. 2); widely used analgesic and antipyretic (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	179.21	2
Melting point (C):	134.00 to 135.00	2
Solubility in water (mg/L, 25C):	1 g/1310 mL	2

August 1987 PHARMACEUTICALS
CAS #: 50-55-5 Reserpine

Other Names: 11,17-Dimethoxy-18-[(3,4,5-trimethoxybenzoyl)oxy]yohimban-16-carboxylic acid methyl ester; 3,4,5-trimethoxybenzoyl methyl reserpate; Alserin; Austrapine; Crystoserpine; Eskaserp; Hiserpia; Orticalm; Quiescin; Rau-sed; Reserpex; Reserpoid; Rivasin; Roxinoid; Sandril; Sedaraupin; Serfin; Serolfia; Serpanray; Serpasil; Serpasol; Serpate; Serpen; Serpine; Serpiloid; Abesta; Abicol; Adelfan; ENT-50146; Enipresser; Gammaserpine; Anquil; R-E-S; Rausan; Roxel; Tenserlix; USAF CB-27; Triserpin; Unilord; Terbolan; Vio-serpine; V-Serp; Tensional; Tensionorme; (many more)
Haz Waste #: U200 Ind/EPA Gen #:
Formula: C33H40N2O9
Description: Long prisms; listed as a carcinogen by the EPA (Ref. 2); marketed under at least 150 trade names; used for treating hypertension and as a tranquilizer and sedative (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	608.70	2
Boiling point (C):	(decomposes) 264.00 to 265.00	2
Solubility in water (mg/L, 25C):	Very sparingly soluble	2

August 1987 PHARMACEUTICALS
CAS #: 81-07-2 Saccharin

Other Names: 1,2-Benzisothiazol-3(2H)-one 1,1-dioxide; Benzosulfimide; 2,3-Dihydro-3-oxobenzisosulfonazole; Saccharin insoluble; 1,2-Dihydro-2-ketobenzisosulfonazole; o-Sulfobenzimide; Benzoic sulfimide; o-Sulfobenzoic acid imide; Gluside; Glucid; Garantose; Saccharinol; Saccharinose; Saccharol; Saxin; Sykose; Hermesetas; Anhydro-o-sulfaminebenzoic acid; Natreen; Kandiset; Gluside; Benzosulfinide; Benzosulphimide; 3-Hydroxybenzisothiazole-S,S-dioxide; O-Benzoyl sulfimide; Benzo-2-sulphimide; 3-Benzisothiazolinone 1,1-dioxide
Haz Waste #: U202 Ind/EPA Gen #:
Formula: C7H5NO3S
Description: Monoclinic crystals; 500 time as sweet as sugar; listed as a carcinogen by the EPA (Ref. 2); white crystalline powder (Ref. 12)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	183.18	2
Melting point (C):	228.80 to 229.70	2
Density (g/cc, 20C):	0.8280	2
Solubility in water (mg/L, 25C):	1 g/290 ml (? C)	2

August 1987 PHARMACEUTICALS
CAS #: 94-59-7 Safrole

Other Names: 5-(2-Propenyl)-1,3-benzodioxole; 4-Allyl-1,2-methylenedioxybenzene; Allylcatechol methylene ether; Allyldioxybenzene methylene ether; m-Allylpyrocatechin methylene ether
Haz Waste #: U203 Ind/EPA Gen #:
Formula: C10H10O2
Description: Colorless or slightly yellow liquid; sassafras odor; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		162.18	2
Melting point (C):		11.00	2
Boiling point (C):	232.00 to	234.00	2
Density (g/cc, 20C):		1.0960	2
Solubility in water (mg/L, 25C):		Insoluble	2

August 1987 PHARMACEUTICALS
CAS #: 18883-66-4 Streptozotocin

Other Names: 2-Deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-D-glucopyranose; 2-Deoxy-2-(3-methyl-3-nitrosoureido)-D-glucopyranose; Streptozocin; NSC-85998; U-9889; Zanosar N-D-Glucosyl-(2)-N'-nitrosomethylurea; NCI-C03167; STR; STRZ
Haz Waste #: U206 Ind/EPA Gen #:
Formula: C8H15N3O7
Description: Pointed platelets or prisms; listed as a carcinogen by the EPA (Ref. 2); antibiotic with potential for use in cancer chemotherapy (Ref. 12)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		265.22	2
Melting point (C):	(decomposes)	115.00	2
Solubility in water (mg/L, 25C):		Soluble	2

7.15 Dyes

August 1987 DYES
CAS #: 131-89-5 2-Cyclohexyl-4,6-dinitrophenol

Other Names: 2,4-Dinitro-6-cyclohexylphenol; Dinitro-o-cyclohexylphenol; DNOCHP; SN 46
Haz Waste #: P034 Ind/EPA Gen #:
Formula: C12H14N2O5
Description: Cyrstals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	266.25	2
Melting point (C):	106.50 to 107.50	2
Solubility in water (mg/L, 25C):	Very slightly soluble	2

August 1987 DYES
CAS #: 100-01-6 p-Nitroaniline

Other Names: 4-Nitrobenzenamine; p-Nitraniline
Haz Waste #: P077 Ind/EPA Gen #:
Formula: C6H6N2O2
Description: Bright yellowwpowder; forms water soluble salts with mineral acids; highly toxic; absorbed through skin (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	138.12	2
Melting point (C):	146.00	2
Boiling point (C):	(calculated) 332.00	2
Solubility in water (mg/L, 25C):	1 g/1250 mL, 45 mL boiling water	2

August 1987 DYES
CAS #: 79-19-6 Thiosemicarbazide

Other Names: Hydrazinecarbothioamide
Haz Waste #: P116 Ind/EPA Gen #:
Formula: NH2CSNHNH2; CH5N3S
Description: White, crystalline powder

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	91.14	2
Melting point (C):	182.00 to 184.00	2
Solubility in water (mg/L, 25C):	Soluble	2

August 1987 DYES
CAS #: 92-87-5 Benzidine

Other Names: [1,1'-Bipehnyl]-4,4'-diamine; p-Diaminodiphenyl; p,p-Bianiline; 4,4'-Bianiline; 4,4'-Diaminobiphenyl; Fast Corinth base B; p,p'-Dianiline; p,p'-Diaminobiphenyl
Haz Waste #: U021 Ind/EPA Gen #:
Formula: H2NC6H4.C6H4NH2 (Dihydrochloride .2HCl); C12H12N2
Description: White or slightly-reddish, crystalline powder; poisonous; (Dihydrochloride--crystals); solid and vapor rapidly absorbed through skin; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	184.20	3
Melting point (C):	129.00	3
Boiling point (C):	402.00	3
Solubility in water (mg/L, 25C):	(12 C) 400.00	3
RETENTION PROPERTIES:		**Ref.**
log (octanol/water) partition (25C):	1.81	3
Partition coefficient, soil/water:	7.2000	17
Hydrolysis rate, water (1/month, 25C):	Not important	3
Biodegradation rate in water (1/month):	Degradable	3

August 1987 DYES
CAS #: 119-90-4 3,3'-Dimethyoxybenzidine

Other Names: Dianisidine; 3,3'-Dimethoxy-[1,1'-biphenyl]-4,4'-diamine; 3,3'-Dimethoxy-4,4'-diaminobiphenyl
Haz Waste #: U091 Ind/EPA Gen #:
Formula: C14H16N2O2
Description: Crystals

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	244.28	2
Melting point (C):	137.00 to 138.00	2
Solubility in water (mg/L, 25C):	Practically insoluble	2

August 1987 DYES
CAS #: 60-11-7 p-Dimethylaminoazobenzene

Other Names: N,N-Dimethyl-4-(phenylazo)benzenamine; Butter yellow; Methyl yellow; C.I. Solvent Yellow 2; C.I. 11020; 4-Dimethylaminoazobenzene; Atul fast yellow R; DAB; DMAB; Brilliant fast oil yellow; Brilliant fast yellow; Fast yellow; Fat yellow; Oil yellow; P.D.A.B. Sudan yellow; Toyo oil yellow G; USAF EK-338; Waxoline yellow AD; Methyl yellow; Dimethyl yellow; Oleal yellow 2G; Resinol yellow GR; Resoform yellow GGA; Fat yellow A; N,N-Dimethyl-4-aminoazobenzene; Cerasine yellow GG; Somalia yellow A; Stear yellow JB; (many others)
Haz Waste #: U093 Ind/EPA Gen #:
Formula: C14H15N3
Description: Yellow crystalline leaflets; listed as a carcinogen by the EPA (Ref. 2)

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		225.28	2
Melting point (C):	114.00 to	117.00	2
Solubility in water (mg/L, 25C):		Insoluble	2

August 1987 DYES
CAS #: 119-93-7 3,3'-Dimethylbenzinidine

Other Names: o-Tolidine; 3,3'-Dimethyl-[1,1'-biphenyl]-4,4'-diamine; 4,4'-Diamino-3,3'-dimethylbiphenyl
Haz Waste #: U095 Ind/EPA Gen #:
Formula: C14H16N2
Description: White to reddish crystals or crystalline powder

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		212.28	2
Melting point (C):	129.00 to	131.00	2
Solubility in water (mg/L, 25C):		Slightly soluble	2

August 1987 DYES
CAS #: 130-15-4 1,4-Naphthoquinone

Other Names: 1,4-Naphthalenedione; alpha-Naphthoquinone; 1,4-Dihydro-1,4-diketonaphthalene
Haz Waste #: U166 Ind/EPA Gen #:
Formula: C10H6O2
Description: Yellow triclinic needles; odor like that of benzoquinone

PHYSICAL PROPERTIES:			Ref.
Molecular weight:		158.15	2
Melting point (C):	(begins to sublime below 100 C)	126.00	2
Density (g/cc, 20C):		1.4220	2
Solubility in water (mg/L, 25C):		Sparingly soluble	2

August 1987 DYES
CAS #: 72-57-1 Trypan blue

Other Names: 3,3'-[(3,3'-Dimethyl[1,1'-biphenyl]-4,4'-diyl)bis(azo)] bis[5-amino-4-hydroxy-2,7-naphthalenedisulfonic acid] tetrasodium salt; C.I. Direct Blue 14; C.I. 23850; 3,3'-[(3,3'-dimethyl-4,4'-biphenylene)bis(azo)]bis-(5-amino-4-hydroxy-2,7-naphthalenedisulfonic acid) tetrasodium salt; Tetrasodium 3,3'-[(3,3'-dimethyl-4,4'-biphenylene)bis(azo)] bis(5-amino-4-hydroxy-2,7-naphthalenedisulfonate); Sodium ditolyl-diazobis-8-amino-1-naphthol-3,6-disulfonate; Benzamine Blue; Diamine Blue; Benzo Blue; Congo Blue; Dianil Blue; Naphthylamine Blue; Niagara Blue
Haz Waste #: U236 Ind/EPA Gen #:
Formula: $C_{34}H_{24}N_6Na_4O_{14}S_4$
Description: Bluish-gray powder, forming a deep blue solution with violet tinge in water; a biological stain (Ref. 2)

PHYSICAL PROPERTIES:		Ref.
Molecular weight:	960.83	2
Solubility in water (mg/L, 25C):	Soluble	2

INDEX TO ORGANICS

(including primary name, P/U number and category)

1,1,1,2-Tetrachloroethane	U208	HALOGENATED SOLVENTS
1,1,1-Trichloroethane	U226	HALOGENATED SOLVENTS
1,1,2,2-Tetrachloroethane	U209	HALOGENATED SOLVENTS
1,1,2-Trichloroethane	U227	HALOGENATED SOLVENTS
1,1-Dichloroethane	U076	HALOGENATED SOLVENTS
1,1-Dichloroethylene	U078	HALOGENATED SOLVENTS
1,1-Dimethylhydrazine	U098	REACTIVE (NON-CYANIDE)
1,2,4,5-Tetrachlorobenzene	U207	HALOGENATED N.O.S.
1,2,4-Trichlorobenzene	X015	HALOGENATED N.O.S.
1,2-Dibromo-3-chloropropane pesticides	U066	HALOGENATED PESTICIDES
1,2-Dibromoethane	U067	HALOGENATED N.O.S.
1,2-Dichlorobenzene	U070	HALOGENATED SOLVENTS
1,2-Dichloroethane	U077	HALOGENATED SOLVENTS
1,2-Dichloropropane	U083	HALOGENATED SOLVENTS
1,2-Dimethyl hydrazine	U099	REACTIVE (NON-CYANIDE)
1,2-Dipehnylhydrazine	U109	REACTIVE (NON-CYANIDE)
1,3-Dichlorobenzene	U071	HALOGENATED SOLVENTS
1,3-Dichloropropene	U084	HALOGENATED SOLVENTS
1,3-Pentadiene	U186	POLYMERIZABLE
1,3-Propane sulfone	U193	ORGANO-SULFURS
1,4-Dichloro-2-butene	U074	HALOGENATED SOLVENTS
1,4-Dichlorobenzene	U072	HALOGENATED PESTICIDES
1,4-Dioxane	U108	NONHALOGENATED SOLVENTS
1,4-Naphthoquinone	U166	DYES
1-(o-Chlorophenyl)thiourea	P026	HALOGENATED N.O.S.
1-Acetyl-2-thiourea	P002	ORGANO-SULFURS
1-Chloro-2,3-epoxypropane	U041	HALOGENATED N.O.S.
1-Naphthyl-2-thiourea	P072	NONHALOG. PESTICIDES
1-Naphthylamine	U167	ORGANO-NITROGENS
2,3,4,6-Tetrachlorophenol pesticides	U212	HALOGENATED PESTICIDES
2,4,5-Trichlorophenol pesticides	U230	HALOGENATED PESTICIDES
2,4,5-Trichlorophenoxy acetic acid pest	U232	HALOGENATED PESTICIDES
2,4,6-Trichlorophenol Pesticides	U231	HALOGENATED PESTICIDES
2,4-D Pesticides	P035	HALOGENATED PESTICIDES
2,4-Dichlorophenol Pesticides	U081	HALOGENATED PESTICIDES
2,4-Dimethylphenol	U101	PHENOLICS
2,4-Dinitrophenol	P048	PHENOLICS
2,4-Dinitrotoluene	U105	ORGANO-NITROGENS
2,4-Dithiobiuret	P049	NONHALOG. PESTICIDES
2,6-Dichlorophenol pesticides	U082	HALOGENATED PESTICIDES
2,6-Dinitrotoluene	U106	ORGANO-NITROGENS
2-Acetylaminofluorene	U005	POLYNUCLEAR AROMATICS
2-Chloroethyl vinyl ether	U042	HALOGENATED N.O.S.
2-Chloronaphthalene	U047	HALOGENATED N.O.S.
2-Chlorophenol Pesticides	U048	HALOGENATED PESTICIDES
2-Cyclohexyl-4,6-dinitrophenol	P034	DYES
2-Methylaziridine	P067	POLYMERIZABLE
2-Methyllactonitrile	P069	POLYMERIZABLE
2-Naphthylamine	U168	ORGANO-NITROGENS
2-Nitropropane	U171	NONHALOGENATED SOLVENTS
2-Picoline	U191	NONHALOGENATED SOLVENTS
3,3'-Dichlorobenzidine	U073	HALOGENATED N.O.S.
3,3'-Dimethylbenzinidine	U095	DYES
3,3'-Dimethyoxybenzidine	U091	DYES
3,3-Dimethyl	P045	NONHALOG. PESTICIDES
3-Chloropropionitrile	P027	HALOGENATED N.O.S.
3-Methylcholanthrene	U157	POLYNUCLEAR AROMATICS
4,4'-DDD Pesticides	U060	HALOGENATED PESTICIDES
4,4'-DDT Pesticides	U061	HALOGENATED PESTICIDES
4,4'-Methylenebis[2-chloroaniline]	U158	HALOGENATED N.O.S.

4,6-Dinitro-o-cresol	P047	NONHALOG. PESTICIDES
4-Aminopyridine	P008	PHARMACEUTICALS
4-Bromophenal phenyl ether	U030	HALOGENATED N.O.S.
4-Chloro-o-toluidine hydrochloride	U049	HALOGENATED N.O.S.
4-Nitrophenol	U170	PHENOLICS
5-(Aminomethyl)-3-isoxazolol	P007	PHARMACEUTICALS
5-Nitrotoluidine	U181	ORGANO-NITROGENS
7,12-Dimethylbenz[a]anthracene	U094	POLYNUCLEAR AROMATICS
7-Oxabicyclo	P088	NONHALOG. PESTICIDES
Acetaldehyde	U001	OXYGENATED
Acetone	U002	NONHALOGENATED SOLVENTS
Acetonitrile	U003	NONHALOGENATED SOLVENTS
Acetophenone	U004	OXYGENATED
Acetyl chloride	U006	REACTIVE (NON-CYANIDE)
Acrolein	P003	POLYMERIZABLE
Acrylamide	U007	POLYMERIZABLE
Acrylic acid	U008	POLYMERIZABLE
Acrylonitrile	U009	POLYMERIZABLE
Aldicarb	P070	NONHALOG. PESTICIDES
Aldrin Pesticides	P004	HALOGENATED PESTICIDES
Allyl alcohol	P005	POLYMERIZABLE
Amitrole	U011	NONHALOG. PESTICIDES
Ammonium picrate	P009	REACTIVE (NON-CYANIDE)
Aniline	U012	NONHALOGENATED SOLVENTS
Auramine	U014	NONHALOG. PESTICIDES
Azaserine	U015	PHARMACEUTICALS
Benz(c)acridine	U016	POLYNUCLEAR AROMATICS
Benz[a]anthracene	U018	POLYNUCLEAR AROMATICS
Benzal chloride	U017	HALOGENATED N.O.S.
Benzene	U019	NONHALOGENATED SOLVENTS
Benzenesulfonyl chloride	U020	REACTIVE (NON-CYANIDE)
Benzidine	U021	DYES
Benzo[a]pyrene	U022	POLYNUCLEAR AROMATICS
Benzotrichloride	U023	REACTIVE (NON-CYANIDE)
Benzyl chloride	P028	HALOGENATED N.O.S.
Bromoacetone	P017	HALOGENATED N.O.S.
Bromoform	U225	HALOGENATED SOLVENTS
Bromomethane	U029	HALOGENATED N.O.S.
Brucine	P018	NONHALOG. PESTICIDES
Cacodylic acid	U136	NONHALOG. PESTICIDES
Carbon disulfide	P022	NONHALOGENATED SOLVENTS
Carbon tetrachloride	U211	HALOGENATED SOLVENTS
Carbonyl fluoride	U033	HALOGENATED N.O.S.
Chlorambucil	U035	HALOGENATED N.O.S.
Chlordane Pesticides	U036	HALOGENATED PESTICIDES
Chloroacetaldehyde	P023	HALOGENATED N.O.S.
Chlorobenzene	U037	HALOGENATED SOLVENTS
Chlorobenzilate pesticides	U038	HALOGENATED PESTICIDES
Chlorodibromomethane	U040	HALOGENATED N.O.S.
Chloroform	U044	HALOGENATED SOLVENTS
Chloromethane	U045	HALOGENATED N.O.S.
Chloromethyl methyl ether	U046	HALOGENATED N.O.S.
Chrysene	U050	POLYNUCLEAR AROMATICS
Creosote	U051	PHENOLICS
Creosote	U051	PHENOLICS
Crotonaldehyde	U053	POLYMERIZABLE
Cumene	U055	OXYGENATED
Cyanogen	P031	OXYGENATED
Cyanogen chloride	P033	OXYGENATED
Cyclohexane	U056	NONHALOGENATED SOLVENTS

Cyclohexanone	U057 NONHALOGENATED SOLVENTS
Cyclophosphamide	U058 NONHALOG. PESTICIDES
Daunomycin	U059 PHARMACEUTICALS
Diallate pesticides	U062 HALOGENATED PESTICIDES
Dibenz[a,h]anthracene	U063 POLYNUCLEAR AROMATICS
Dibenzo(a,i)pyrene	U064 POLYNUCLEAR AROMATICS
Dibromomethane	U068 HALOGENATED N.O.S.
Dichlorodifluoromethane	U075 HALOGENATED SOLVENTS
Dieldrin Pesticides	P037 HALOGENATED PESTICIDES
Diepoxybutane	U085 OXYGENATED
Diethyl p-nitrophenyl phosphate	P041 NONHALOG. PESTICIDES
Diethyl phthalate	U088 PHTHALATES
Diethylhydrazine	U086 REACTIVE (NON-CYANIDE)
Diethylstilbestrol	U089 PHARMACEUTICALS
Dihydrosafrole	U090 PHARMACEUTICALS
Diisopropyl fluorophosphate	P043 NONHALOG. PESTICIDES
Dimethoate	P044 NONHALOG. PESTICIDES
Dimethyl phthalate	U102 PHTHALATES
Dimethyl sulfate	U103 REACTIVE (NON-CYANIDE)
Dimethylamine	U092 ORGANO-NITROGENS
Dimethylcarbamoyl chloride pesticides	U097 HALOGENATED PESTICIDES
Dinoseb	P020 NONHALOG. PESTICIDES
Disulfoton	P039 NONHALOG. PESTICIDES
Endrin Pesticides	P051 HALOGENATED PESTICIDES
Epinephrine	P042 PHARMACEUTICALS
Ethyl acetate	U112 NONHALOGENATED SOLVENTS
Ethyl acrylate	U113 POLYMERIZABLE
Ethyl ether	U117 NONHALOGENATED SOLVENTS
Ethyl methacrylate	U118 POLYMERIZABLE
Ethyl methanesulfonate	U119 ORGANO-SULFURS
Ethylene bis-dithiocarbamate	U114 NONHALOG. PESTICIDES
Ethylene diamine	P053 NONHALOGENATED SOLVENTS
Ethylene oxide	U115 POLYMERIZABLE
Ethylene thioruea	U116 ORGANO-SULFURS
Ethylenimine	P054 POLYMERIZABLE
Famphur	P097 NONHALOG. PESTICIDES
Fluoranthene	U120 POLYNUCLEAR AROMATICS
Fluoroacetamide pesticides	P057 HALOGENATED PESTICIDES
Fluorotrichloromethane	U121 HALOGENATED SOLVENTS
Formaldehyde	U122 OXYGENATED
Formic acid	U123 OXYGENATED
Furan	U124 NONHALOGENATED SOLVENTS
Furfural	U125 NONHALOGENATED SOLVENTS
Glycidaldehyde	U126 OXYGENATED
Heptachlor Pesticides	P059 HALOGENATED PESTICIDES
Hexachlorobenzene	U127 HALOGENATED PESTICIDES
Hexachlorobutadiene Pesticides	U128 HALOGENATED PESTICIDES
Hexachlorocyclopentadiene Pesticides	U130 HALOGENATED PESTICIDES
Hexachlorophene pesticides	U132 HALOGENATED PESTICIDES
Hexachloropropene pesticides	U243 HALOGENATED PESTICIDES
Hydrazine	U133 REACTIVE (NON-CYANIDE)
Hydroxycoumarin salts	P001 NONHALOG. PESTICIDES
Indeno (1,2,3-c,d) pyrene	U137 POLYNUCLEAR AROMATICS
Indomethacin	P025 HALOGENATED N.O.S.
Isobutanol	U140 NONHALOGENATED SOLVENTS
Isocyanic acid methyl ester	P064 OXYGENATED
Isodrin pesticides	P060 HALOGENATED PESTICIDES
Isosafrole	U141 PHARMACEUTICALS
Kepone Pesticides	U142 HALOGENATED PESTICIDES
Lasiocarpine	U143 PHARMACEUTICALS

Lindane pesticides	U129 HALOGENATED PESTICIDES
Maleic anhydride	U147 POLYMERIZABLE
Malononitrile	U149 POLYMERIZABLE
Melphalan	U150 HALOGENATED N.O.S.
Methacrylonitrile	U152 POLYMERIZABLE
Methanol	U154 NONHALOGENATED SOLVENTS
Methomyl	P066 NONHALOG. PESTICIDES
Methoxychlor	U247 HALOGENATED PESTICIDES
Methyl Chlorocarbonate	U156 HALOGENATED N.O.S.
Methyl ethyl ketone	U159 NONHALOGENATED SOLVENTS
Methyl ethyl ketone peroxide	U160 REACTIVE (NON-CYANIDE)
Methyl isobutyl ketone	U161 NONHALOGENATED SOLVENTS
Methyl mercaptan	U153 ORGANO-SULFURS
Methyl methacrylate	U162 POLYMERIZABLE
Methyl parathion	P071 NONHALOG. PESTICIDES
Methylene chloride	U080 HALOGENATED N.O.S.
Methylhydrazine	P068 REACTIVE (NON-CYANIDE)
Methylthiouracil	U164 PHARMACEUTICALS
Mitomycin C	U010 NONHALOG. PESTICIDES
N,N-Bis(2-chloroethyl)-2-naphthylamine	U026 HALOGENATED N.O.S.
N-Dipropylamine	U110 ORGANO-NITROGENS
N-Methyl-N'-nitro-N-nitrosoguanidine	U163 PHARMACEUTICALS
N-Nitroso-N-ethylurea	U176 ORGANO-NITROGENS
N-Nitroso-N-methylurea	U177 ORGANO-NITROGENS
N-Nitroso-N-methylurethane	U178 ORGANO-NITROGENS
N-Nitroso-di-n-butylamine	U172 ORGANO-NITROGENS
N-Nitroso-methylvinylamine	P084 ORGANO-NITROGENS
N-Nitrosodiethylamine	U174 ORGANO-NITROGENS
N-Nitrosodimethylamine	P082 ORGANO-NITROGENS
N-Nitrosoethanolamine	U173 ORGANO-NITROGENS
N-Nitrosopiperidine	U179 ORGANO-NITROGENS
N-Nitrosopyrrolidine	U180 ORGANO-NITROGENS
N-Phenylthiourea	P093 NONHALOG. PESTICIDES
N-nitroso-diphenylamine	P083 ORGANO-NITROGENS
Na Fluoracetic acid pesticides	P058 HALOGENATED PESTICIDES
Naphthalene	U165 POLYNUCLEAR AROMATICS
Nicotine	P075 NONHALOG. PESTICIDES
Nitrobenzene	U169 ORGANO-NITROGENS
Nitroglycerine	P081 REACTIVE (NON-CYANIDE)
O,O-Diethyl	U087 NONHALOG. PESTICIDES
O,O-Diethyl P	P040 NONHALOG. PESTICIDES
Octamethylpyrophosphoramide	P085 NONHALOG. PESTICIDES
P-alpha-Dimethylphenethylamine	P046 ORGANO-NITROGENS
Paraldehyde	U182 OXYGENATED
Parathion	P089 NONHALOG. PESTICIDES
Pentachlorobenzene	U183 HALOGENATED N.O.S.
Pentachloroethane	U184 HALOGENATED N.O.S.
Pentachloronitrobenzene pesticides	U185 HALOGENATED PESTICIDES
Pentachlorophenol Pesticides	U242 HALOGENATED PESTICIDES
Phenacetin	U187 PHARMACEUTICALS
Phenol	U188 PHENOLICS
Phorate	P094 NONHALOG. PESTICIDES
Phosgene	P095 HALOGENATED N.O.S.
Phthalic anhydride	U190 PHTHALATES
Pronamide	U192 ORGANO-NITROGENS
Propanenitrile	P101 OXYGENATED
Propargyl alcohol	P102 POLYMERIZABLE
Propylene glycol	P100 NONHALOGENATED SOLVENTS
Pyridine	U196 NONHALOGENATED SOLVENTS
Reserpine	U200 PHARMACEUTICALS

Resorcinol	U201 PHENOLICS
Saccharin	U202 PHARMACEUTICALS
Safrole	U203 PHARMACEUTICALS
Silvex pesticides	U233 HALOGENATED PESTICIDES
Streptozotocin	U206 PHARMACEUTICALS
Strychnine and salts	P108 NONHALOG. PESTICIDES
Tetrachloroethylene	U210 HALOGENATED SOLVENTS
Tetraethyldithiopyrophosphate	P109 NONHALOG. PESTICIDES
Tetraethylpyrophosphate	P111 NONHALOG. PESTICIDES
Tetrahydrofuran	U213 NONHALOGENATED SOLVENTS
Tetranitromethane	P112 REACTIVE (NON-CYANIDE)
Thioacetamide	U218 ORGANO-SULFURS
Thiophenol	P014 ORGANO-SULFURS
Thiosemicarbazide	P116 DYES
Thiourea	U219 ORGANO-SULFURS
Thiram	P117 NONHALOG. PESTICIDES
Toluene	U220 NONHALOGENATED SOLVENTS
Toluene diamine	U221 POLYMERIZABLE
Toluene diisocyanate	U223 POLYMERIZABLE
Toxaphene Pesticides	P123 HALOGENATED PESTICIDES
Trichloroacetaldehyde	U034 HALOGENATED N.O.S.
Trichloroethylene	U228 HALOGENATED SOLVENTS
Trichloromethanethiol	P118 HALOGENATED N.O.S.
Trypan blue	U236 DYES
Uracil mustard	U237 HALOGENATED N.O.S.
Urethane	U238 POLYMERIZABLE
Vinyl chloride	U043 HALOGENATED N.O.S.
alpha,alpha-Dimethylbenzyl hydroperoxid	U096 REACTIVE (NON-CYANIDE)
alpha-Endosulfan Pesticides	P050 HALOGENATED PESTICIDES
bis(2-chloroethyl)ether	U025 HALOGENATED N.O.S.
bis(Chloromethyl) ether	P016 HALOGENATED SOLVENTS
bis-(2-chloroethyoxy)methane	U024 HALOGENATED N.O.S.
bis-(2-chloroisopropyl)ether	U027 HALOGENATED N.O.S.
bis-(2-ethylhexyl) phthalate	U028 PHTHALATES
cis-1,2-Dichloroethylene	U079 HALOGENATED SOLVENTS
d-n-Octyl phthalate	U107 PHTHALATES
di-n-Butyl phthalate	U069 PHTHALATES
di-n-Propylnitrosamine	U111 ORGANO-NITROGENS
n-Butyl alcohol	U031 NONHALOGENATED SOLVENTS
n-Propylamine	U194 ORGANO-NITROGENS
o-Toluidine hydrochloride	U222 OXYGENATED
o-Xylene	U239 NONHALOGENATED SOLVENTS
p-Chloro-m-cresol pesticides	U039 HALOGENATED PESTICIDES
p-Chloroaniline	P024 HALOGENATED N.O.S.
p-Cresol	U052 PHENOLICS
p-Dimethylaminoazobenzene	U093 DYES
p-Nitroaniline	P077 DYES
p-Quinone	U197 OXYGENATED
sym-Trinitrobenzene	U234 REACTIVE (NON-CYANIDE)
trans-1,2-Dichloroethylene	U079 HALOGENATED SOLVENTS

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