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APPLICATION OF PROMPT GAMMA ACTIVATION ANALYSIS (PGAA) TO INORGANIC PHOTOCROMIC HOST MATERIALS. D. L. Perry, R. Gatti, R. B. Firestone, Lawrence Berkeley National Laboratory, Berkeley, CA 94720 and G. L. Molnar, Zs. Revay, and Zs. Kasztovszky, Department of Nuclear Research, Institute of Isotope and Surface Chemistry, Chemical Research Center, POB 77, H-1525 Budapest, Hungary.

Work reported here focused on the detection of contaminant ions that are present in photochromic material lattices using prompt-gamma neutron activation analysis (PGAA). The work includes two oxides, zinc oxide and hafnium oxide and one fluoride, calcium fluoride, three representative inorganic host materials that exhibit photochromism when doped with low levels of other metal ions. Analytical results are presented and compared to levels of host contaminants that were estimated prior to analyses. Elemental cross sections for various common metal ion dopants in thermochromic host materials are discussed. A detailed description of the PGAA technique is given, and the results are discussed with respect to lattice conditions and mechanisms that affect the photochromic process.

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