

# Lawrence Berkeley National Laboratory

## Recent Work

### Title

DISCUSSION OF ""OPTICAL STUDIES OF ELECTROLYTE FILMS ON GAS ELECTRODES"".

### Permalink

<https://escholarship.org/uc/item/30c6s42d>

### Author

Muller, R.H.

### Publication Date

1967-03-01

UCRL-17443

University of California

Ernest O. Lawrence  
Radiation Laboratory

**DISCUSSION OF "OPTICAL STUDIES OF ELECTROLYTE  
FILMS ON GAS ELECTRODES"**

**TWO-WEEK LOAN COPY**

*This is a Library Circulating Copy  
which may be borrowed for two weeks.  
For a personal retention copy, call  
Tech. Info. Division, Ext. 5545*

## **DISCLAIMER**

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.

UCRL-17443

Reply submitted to: J. Electrochem. Soc.

UNIVERSITY OF CALIFORNIA  
Lawrence Radiation Laboratory  
Berkeley, California  
AEC Contract No. W-7405-eng-48

DISCUSSION OF "OPTICAL STUDIES OF ELECTROLYTE  
FILMS ON GAS ELECTRODES"

R. H. Muller

March 1967

DISCUSSION OF "OPTICAL STUDIES OF ELECTROLYTE  
FILMS ON GAS ELECTRODES"

R. H. Muller

Inorganic Materials Research Division, Lawrence Radiation Laboratory,  
University of California, Berkeley, California

MARCH 1967

I wish to thank Dr. Bikerman for drawing my attention to his interesting work on the effect of surface roughness on gravitational drainage of oil films.

Although it is realized that the quantitative characterization of the smoothness of optically polished surfaces is difficult, indications are that the rugosity of the surfaces employed was considerably lower than the thickness ( $0.3-0.6\mu$ ) of the electrolyte films observed. Examination of the electrode surfaces by double beam and multiple beam interference microscopy showed the largest polishing marks present to be  $0.05\mu$  deep and about  $0.02\mu$  wide. They were oriented at random and spaced at a mean distance of  $20\mu$  with the intervening area filled with progressively finer and more closely spaced grooves. Measurements with a stylus surface tester were found to be below the resolution limit of the instrument of  $0.05\mu$  rms.

The regression analysis conducted by Bornong<sup>1</sup> for the dependence of the "stagnant" oil layer thickness on surface roughness extrapolates to  $0.78\mu$  and  $0.28\mu$  for zero roughness and, respectively, silver-copper and stainless steel alloys. These figures are surprisingly close to those given in the present work for KOH solution on silver and nickel.

It is felt, therefore, that in the experiments reported, the electrode surface roughness has not been the controlling factor for the formation of stable electrolyte films, although this parameter may be important in an analysis of technical gas electrodes.

ACKNOWLEDGEMENT

This work was done under the auspices of the United States Atomic Energy Commission.

REFERENCE

1. See reference given in the previous discussion.

du 20

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

- A. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or
- B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission, or employee of such contractor, to the extent that such employee or contractor of the Commission, or employee of such contractor prepares, disseminates, or provides access to, any information pursuant to his employment or contract with the Commission, or his employment with such contractor.

