

THE FAR INFRARED SPECTRA OF SOLIDS UNDER HIGH PRESSURE
(33-100 μ)^{*}

J. R. Ferraro, S. S. Mitra^{§+} and C. Postmus

Argonne National Laboratory, Argonne, Illinois

(Received 15 July 1966)

Lippincott and co-workers^{1,2} demonstrated the use of a high pressure diamond cell to study the infrared spectra of solids from 1-15 μ . Later they extended this work to the 35 μ region.^{3,4} Application of the cell for study of liquids has been made by Brasch and Jakobsen.^{5,6} With the use of a Perkin-Elmer #301 spectrophotometer, a modified #301 beam condenser, and a high pressure diamond cell[‡], we have extended the infrared region for use with solids to 100 μ . This communication will discuss the method used, and the results obtained.

The beam condenser was modified by cutting the ellipsoid mirrors to accommodate the diamond cell. The beam condenser with the diamond cell is illustrated in Figure 1. Figure 2 shows the apparatus in place in the #301 spectrophotometer. To allow us to make the alignment of the cell windows in the path of the condensed beam easily and reproducibly, a machine lathe micrometer attachment was used. This allowed freedom in three dimensions.

* Based on work performed under the auspices of the U. S. Atomic Energy Commission. Presented at the 5th National Meeting of the Society for Applied Spectroscopy, June 13-17, 1966, Chicago, Illinois.

§ Permanent address: The University of Rhode Island, Electrical Engineering Department, Kingston, Rhode Island.

+ Supported by the Air Force In-House Laboratory, Independent Research Fund.

‡ High Pressure Diamond Optics, Inc., McLean, Virginia.

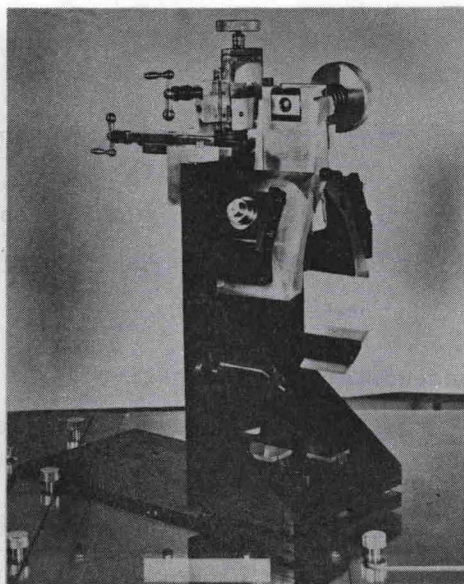


Fig. 1 - High pressure cell mounted in the beam condenser.

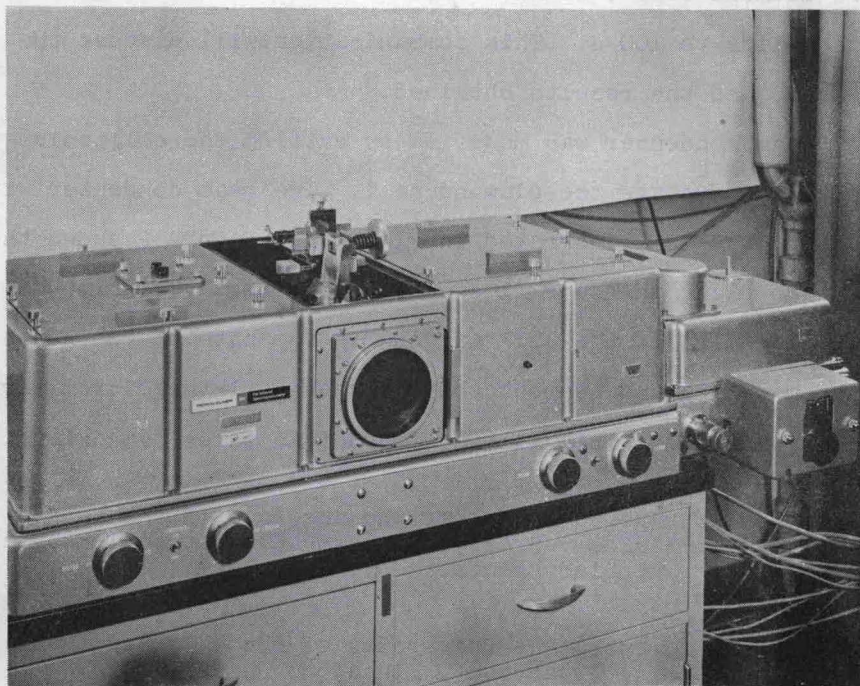


Fig. 2 - High pressure cell in the Perkin-Elmer #301 far infrared spectrophotometer.