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An Unusual Appearance of the Cyanogen Bands

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THE LIMITATIONS OF PRESENT COMPUTATIVE METHODS OF STUDYING LIQUID STRUCTURE

GEORGE A. BOYD

The inadequacy of the approximate method of x-ray diffraction intensity computation in the case of liquids is illustrated by computations relative to n-paraffins. Warren apparently proved, by using Zernike and Prins theory, that the structure of the liquids is hexagonal parallel packing. These computations have been repeated and extended to larger scattering angles. Similar calculations were made for the parallel packing. Conclusive proof for either array was not found. Preference, however, due to peak position, should be given to the former. The work emphasizes the need for a better theoretical approach to the problem of liquid structure in explaining the scattering of x-rays.

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AN INVESTIGATION OF THE FORMATION AND EXCITATION OF THE MERCURY HYDRIDE MOLECULE THROUGH RESONANCE RADIATION

LEONARD O. OLSEN

A weak excitation by collisions of several of the HgH bands belonging to the electronic system $^2\pi \rightarrow {}^2\Sigma$ was detected. It was found that HgH was formed in the $^2\pi_{\frac{1}{2}}$ and $^2\pi_{\frac{3}{2}}$ (excited) states through a collision process involving Hg 6^3P and the H_2 molecule, one Hg 6^3P atom dissociating the H_2 molecule and a second Hg 6^3 atom uniting with an H atom to form the excited HgH molecule.

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AN UNUSUAL APPEARANCE OF THE CYANOGEN BANDS

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A unique formation and excitation of the CN molecule occurred in the resonance tube. (Observed in connection with the investiga-

tion of the mercury hydride molecule.) The bands which were noted belong to the $^2\Sigma \rightarrow {}^2\Sigma$ electronic system. The excitation has been determined to be due to collisions of the CN molecule with excited mercury atoms in the 6^3P state.

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MEAN FREE PATHS OF GAS MOLECULES IN MERCURY VAPOR

JOHN A. ELDRIDGE

The mean free paths have been obtained for hydrogen, helium, nitrogen, carbon dioxide, methane, ethane, propane, butane and isobutane through mercury vapor. The decrease in intensity is observed as a beam of the gas passes through the vapor, any deviation as great as a half degree removing the molecules from the beam. The free paths measured in this way are, as is expected, several times smaller than the values determined from viscosity data.

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X-RAY IONIZATION CHAMBER MATERIALS

J. NORVEL SAYLER

An attempt has been made to reduce leakage and troublesome current fluctuations in ionization chambers due to α-particle emission from materials of which chambers are made. Work of Bearden (Johns Hopkins), 1932, has been checked in good agreement, with one exception. Counts of α-particle emission have been made for steel, electroplated copper, aluminum, tin, brass, and glass, after Bearden, and in addition for platinum, molybdenum, electroplated nickel, and electroplated chromium. Best results were obtained from cold rolled steel. In all cases the materials were cleaned with abrasives, and CH_3Br was used as ionizing gas. A "cage" type ionization chamber, designed to reduce α-particle effects, was studied, and quantitative comparisons with