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## Mean Free Paths of Gas Molecules in Mercury Vapor

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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  $\alpha$ -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  $\alpha$ -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  $\text{CH}_3\text{Br}$  was used as ionizing gas. A "cage" type ionization chamber, designed to reduce  $\alpha$ -particle effects, was studied, and quantitative comparisons with