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## Measurement of Mean Life of Cadmium $^{213}\text{Po}$ by Thermal Motion of Excited Atoms during Life Time

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Since any incident beam gives rise to diffuse scattering ( $A \cos \Theta$ ) plus directed scattering  $B \cos m (\alpha - \Theta)$  centered about a line making a greater angle with the crystal surface than does the incident beam it follows that the scattering is accompanied by an energy exchange.

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## LENS EFFECT OF PRESSURE WINDOWS

CARL BENZ AND THOS. C. POULTER

The lens effect of pressure windows has been studied at pressures as high as 30,000 atmospheres. These lens effects are found to be due to four primary causes. 1st. Pseudo lens effect caused by temperature gradients in the material under pressure. 2nd. The bulging of the outside surface of the pressure windows. 3rd. The Pseudo lens effect due to unequal strains in the glass. 4th. The bulging of the inside surface of the window combined with the difference of index refraction of the material under pressure and the glass or quartz of the window. Methods for correcting for these lens effects are outlined.

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## MEASUREMENT OF MEAN LIFE OF CADMIUM $2^3P_1$ BY THERMAL MOTION OF EXCITED ATOMS DURING LIFE TIME

H. D. KOENIG

Since the experiments of Dunoyer in 1914 some interest has developed in an experiment to show the diffusion of excited atoms in various types of resonance lamps. None of these have been successful due to the short life time of the excited states in the vapors selected. Since experiments made in this laboratory indicate a long life for the Cadmium  $2^3P_1$  state, an attempt was made to measure the life of this state by the motion of the excited atoms in a unidirectional beam shot from a gun of the boiler type, and excited by passing through a narrow beam of light from a Cadmium discharge. The resonance radiation was photographed, a shield hiding the part of the beam in which the atoms were being

excited from the camera. Radiation was observed above the shield edge. Below the shield — the edge near the gun — no radiation was observed indicating that the effect above was not due to secondary resonance. The results indicate a mean life for the Cadmium  $2^8P_1$  state in excess of  $10^{-8}$  seconds.

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### THE SPECTRUM OF MERCURY EXCITED BY CANAL- RAY IMPACT

CARL FRISCHE

The spectrum of mercury is excited by hydrogen canal rays. The velocity of the canal rays is regulated by the voltage applied to a discharge tube and the canal-ray particles are allowed to shoot through a small hole in the cathode. Spectrograms were taken at voltages ranging from 1000 to 12,000 volts and the general characteristics of the spectra were studied. The spectra thus excited had very much the same characteristics as the electron spectrum just below ionization with the exception that several spark lines appeared at the lower voltages. The spark lines became more prominent as the voltage was increased although the relative intensity of the arc lines did not change appreciably. The polarization of the light was also investigated but no polarization was detected.

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### ULTRA-VIOLET ABSORPTION SPECTRA OF CARO- TENE AND VITAMIN A

JAY W. WOODROW AND J. B. PHILIPSON

Using a sensitive photo electric spectrophotometer, carotene derived from carrots and dissolved in an oil, has been found to exhibit an absorption band in the region 325-330  $M\mu$ . An absorption band in this region has been shown by Morton & Heilbron to be characteristic of vitamin A in fats derived from animal sources. The appearance of this band in carotene from a vegetable source, establishes an even closer relationship between these two growth-promoting factors.

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