

New Lines in the Extreme Ultra-Violet of Certain Metals.

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The experiments described below form an extension of the recent work of Lyman,¹ Handke,² Wolff,³ and Saunders⁴, on the extreme ultra-violet region.

By using a fluorite vacuum spectroscope and a vacuum arc lamp, photographs of spectral lines were obtained free from the disturbance due to the absorption of the light by glass, quartz or air. The arc could be manipulated from the outside of the case of the spectrograph; the current ranged from four to fifteen amperes, according to the metal used.

For the hard metals with high melting points the terminals of the arc were made of the metal; when a soft metal was used, the terminals were made of iron and were hollowed out in a cup-shaped cavity in which the metal sample was placed.

The whole apparatus was connected up by a lead pipe to a set of trimount oil pumps in series, so that it could be quickly evacuated. The vacuum was tested by having a discharge tube sealed in by a side connection. The vacuum used when photographs were being taken was that which gives a dark, green discharge.

A hydrogen discharge tube fitted with a fluorite window was arranged in the apparatus, so that on one and the same plate there could be obtained both the hydrogen spectrum and the spectrum of any given metal in the same region. By adjusting the cover slit, a photograph of the gas spectrum could be obtained on the bottom of the plate, and then, without moving the plate, the cover slit could be adjusted the discharge tube could be replaced by the vacuum arc lamp, and thus the spectrum of the metal could be thrown on the same plate just above the hydrogen spectrum. This afforded a means of comparing each metal spectrum with that of the gas.

¹Lyman: Spectroscopy of the Extreme Ultra-Violet (Longmans).

²Handke: Inaug. Diss. Berlin., Aug. 1909.

³Wolff: Ann. de. Phys. 42 p. 825, 1913.

⁴Saunders: Astro phys. Jour. 43, p. 234, 1916.