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Apparatus for Producing Soft X-Rays

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A DEUTERIUM — DEUTERIUM SOURCE OF NEUTRONS

VICTOR YOUNG

A single section accelerator tube built for 300 to 400 k.v. is used to accelerate a beam of deutrons obtained from a conventional arc discharge source. The beam impinges on a target of $P_2O_5 + H_2{}^2O$ producing neutrons according to the reaction

$$H^2 + H^2 = H^3 + n$$

The target assembly is immersed in a tank of water which because of the elastic H^1 and n collisions becomes a source of thermal neutrons.

Detection is accomplished by placing a piece of silver in the tank. The silver becomes artificially beta radioactive by the well known reactions

$$Ag^{108} + n \rightarrow Ag^{109}$$
$$Ag^{109} \rightarrow Cd^{109} + e -$$

Since the half life of the beta activity is something over three minutes there is ample time to remove the silver from the tank and detect the beta particles with a thin walled Geiger-Müller counter.

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APPARATUS FOR PRODUCING SOFT X-RAYS

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A 30-watt soft x-ray apparatus has been designed to provide a simple and economical source of soft x-rays for radiography in the wavelength region between 1.1 and 0.6 Angstroms. The x-ray tube was constructed of pyrex, and a thin spherical window incorporated for transmitting the radiation. The electrical equipment was built from standard laboratory parts, employing a neon sign transformer as a source of potential.

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