A Deuterium - Deuterium Source of Neutrons

Victor Young

State University of Iowa
A single section accelerator tube built for 300 to 400 k.v. is used to accelerate a beam of deuterons obtained from a conventional arc discharge source. The beam impinges on a target of $\text{P}_2\text{O}_5 + \text{H}_2\text{O}$ producing neutrons according to the reaction

$$\text{H}_2 + \text{H}_2 = \text{H}_3 + n$$

The target assembly is immersed in a tank of water which because of the elastic $\text{H}_1$ 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

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

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.

APPARATUS FOR PRODUCING SOFT X-RAYS

F. M. Bailey

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.