C. Nuclear Radiations of Am^{241}.

The disintegration of Am^{241} is accompanied by the emission of alpha-particles and some associated electromagnetic radiation. The energy of the alpha-particles has been measured by two methods: (1) absorption in thin mica sheets of known thickness and (2) differential analysis, by electronic means, of the pulses produced by the alpha-particles in an ionization chamber[11] (Figure 2). In both methods the energy was obtained from direct comparison with standard samples of other alpha activities of known energies. The values from the two methods check closely at 5.45 ± 0.05 Mev. In the mica absorption method the observed value is in terms of the range in air which is converted to energy in Mev by use of the range-energy relation given by Holloway and Livingston[12].

< Fig. 2

Absorption measurements on the electromagnetic radiations are shown graphically in Figures 3, 4, and 5. The intensities shown are for a sample containing 10^6 disintegrations per minute of alpha-particle activity. The apparatus used to detect the radiations was a bell jar type Geiger counting tube, 1-1/8 inches in diameter and 2-5/8 inches long. The window was of mica, ca. 3 mg.cm.$^{-2}$ thick and the body of the tube was copper. The tube was filled with a 90% argon-10% ethanol mixture to 10 cm. Hg pressure. The cathode was a 5 mil tungsten wire terminating in a small glass bead 3/16 inch from the mica window. Samples were counted in a position to have a 10% geometry factor.

< Fig. 3, 4, and 5

The electromagnetic radiations observed are seen to be of two classes: (1) a 62 kev component, the counting efficiency for which is about 0.5 percent under the above conditions, and (2) a complex mixture of radiations apparently covering the range 10 to 20 kev which have the absorption characteristics of neptunium L x-radiation. The counting efficiency for the latter is not readily calculated, but is probably ca. 1.5 percent under the above conditions. The aluminum absorption