

These pits were randomly distributed throughout the replica specimens, and can probably be attributed to rhodonite inclusions in the sample. Only a very few isolated pits of similar appearance could be found among the specimens prepared from the high-transition-temperature metal; but it was noticed that pronounced attack had occurred along a number of grain boundaries in which segregation appears to have taken place. This effect is typified in Fig. 3 ($\times c. 8,600$), and could be explained by assuming the segregation of rhodonite in a fine amorphous form.

This work provides an example, rare in practice, in which the electron microscope can be used to advantage for the examination of non-metallic inclusions.

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An External Cathode Hard-Glass Geiger-Müller Tube

IN the course of work on the development of Geiger-Müller counters in this laboratory, some interesting properties of a hard-glass external cathode ('Aquadag') counter have been observed. Argon-alcohol counters filled to a pressure of 10 cm. of mercury, having internal diameters of one inch, and using a 7-mil central tungsten wire, were found to have plateaux extending from 1,200 volts to more than 3,000 volts. The slope of these plateaux was generally found to be less than 0.4 per cent per 100 volts. It was noted that the size of the pulses obtained from these counters is reduced with enhanced rate of counting. This phenomenon results

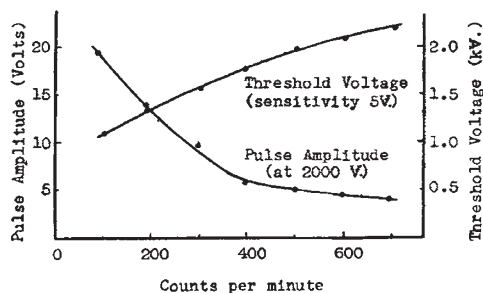


Fig. 1

in an apparent upward shift of the threshold voltage with increased rate of counting. The slope and length of the plateau remain unaffected by incidence of strong radiation, and the shift in the threshold voltage can be nullified by using a preamplifier at the input of the scaler. The decrease in pulse size and the consequent increase of the threshold voltage are shown in Fig. 1.

The dead time of these counters has been found to be of the order of 3×10^{-4} sec., and compares not too unfavourably with that of 2×10^{-4} sec. generally reported for internal cathode counters¹. With the use of a single tube preamplifier the counter efficiently recorded more than 4,000 counts per minute and showed a characteristic which has been plotted in Fig. 2.

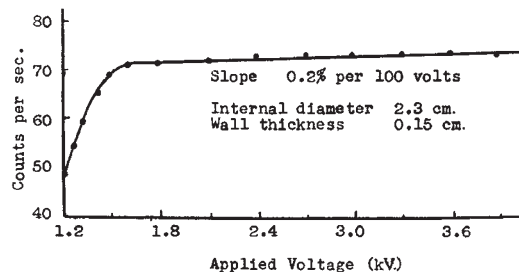


Fig. 2

A more complete account of this counter and a discussion of the results will shortly appear elsewhere.

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¹ Korff, S. A., "Electron and Nuclear Counters", 95 (New York: Van Nostrand; London: Macmillan, 1946).

Electrical and Optical Characteristics of D.C. Corona Discharge

ENGLISH¹ has recently described the application of a photomultiplier—wide-band (100 Mc./s.) amplifier—oscilloscope technique to the study of the visible radiations emitted by the pre-onset streamers²⁻⁴ in d.c. corona. Independently, similar techniques have been used in this laboratory during the past year for the study of positive point-to-plane coroná (following earlier applications of similar techniques to spark channels^{5,6} and impulse corona^{7,8}).

The apparatus used included a conventional amplifier, having a rise time of 0.05 μ sec., and an oscilloscope^{9,10} using a 10,000-volt cathode-ray tube. The light pulses from pre-breakdown streamers in corona in air at atmospheric pressure are similar in shape but much longer (0.4 μ sec. at 30 per cent of maximum pulse height) than those recorded by English (0.06 μ sec.). Although the band-width of the apparatus