

value in about 2.78 days. In the present investigation the gas was studied under slightly different circumstances. As soon as it was received from the well a rod was exposed in it at different times and under negative electrification for different periods. The rod in each exposure was rendered active by the deposit of the substance causing excited radioactivity, and it was always found that the removal of the active rod was followed by a rise in the conductivity of the gas to a maximum value, after which it gradually fell according to an experimental law in the same manner as before. A typical set of observations on this variation in the conductivity is given in Table I., and a curve representing them is shown in Fig. 1.

In this case a negatively charged rod was exposed at 11,000 volts in the gas for ten hours, and it will be seen from the values given above that the conductivity steadily rose and reached a maximum value in about four hours after the removal of the negatively charged rod. It will also be seen that after the maximum value was reached the conductivity fell to one half value in about seventy hours.

In order to investigate how the activity excited in a negatively charged rod varied with the time of exposure, a series of exposures for different periods was made on one day and the results of these observations are given in Table II. and curves illustrating them are shown in Fig. 2.

Before commencing this set of exposures a rod connected to the negative terminal of the electrical machine was suspended in the gas for about two hours. It was then withdrawn and the first exposure was made. During the intervals which elapsed between the different exposures, the electric field was always applied in the same manner to the gas, with the object of making the exposures in the presence of a freshly produced disintegration product.

The values given in Table II. and represented graphically in Fig. 2 show that for all periods of exposure the radiation decreased initially, then reached a steady state which lengthened as the period of the exposure decreased, after which it dropped steadily and approached a zero value.

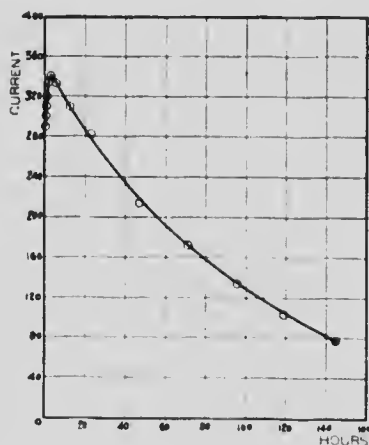


Fig. 1.