change in any interval depends upon the scale on which the experiment is carried out. It is thus often possible so to arrange matters, that while the amount of change accomplished in a suitable interval is sufficient for the requirements of an accurate analysis, yet the fractional alteration in the concentrations of the reagents involved is so small that the rate may be treated as practically constant during the interval. The amount of change divided by the time then gives the rate $dx/d\theta$ directly. This method is singularly applicable in the case of a reaction where the rate passes through a maximum or minimum, or where for any other reason the rate does not vary greatly with changes in the concentration ; and in general whenever the substance produced can be determined accurately in the presence of relatively large quantities of the substances from which it is formed. As the concentrations of the products of the reaction are small in comparison with those of the reagents, complications may often be avoided by the use of the method of constant rates.

The effect of varying the concentration was studied through as wide an interval as possible, the limits being : — potassium chlorate F/240[1] to 3.3F, potassium iodide. F/40 to 2F, hydrochloric acid, F/30 to 2/F. As hydrochloric acid may be regarded as a mixture of chlorine-ion and hydrogen-ion, further experiments were necessary to determine the effect of the concentration of each of these individually.

The following series of experiments were carried out : —

Series A. — In connection with the method of analysis employed in Series B, a number of experiments on the acceleration of the reaction by iron salts.

Series B. — The concentration of the potassium chlorate much less than those of the other reagents. A method of determining chloric acid without the use of a pressure bottle is described.

Series C. — Experiments to determine the magnitude of the retardation caused by the iodine set free during the reaction.

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[1] One gramme Formula weight in 240 liters.