

THE RATES OF THE REACTIONS IN SOLUTIONS CONTAINING POTASSIUM BROMATE, POTASSIUM IODIDE AND HYDROCHLORIC ACID

BY ROBERT H. CLARK

Among the earliest contributions to the literature of this subject is a paper by W. Ostwald,¹ who studied the reaction between hydrogen iodide and bromate in order to determine the accelerating influence of different acids. The author did not attempt to formulate a satisfactory kinetic equation, but calculated the velocity constant from the bi-molecular formula, and came to the conclusion that, in general, the accelerating influence of the different acids is proportional to their affinity constants,² the chief exception being in the case of chromic acid. I have carried out a number of experiments on the action of chromic acid, which will appear in a second communication.

In the same year W. Meyerhoffer³ and O. Burchard,⁴ working independently of each other, investigated the reaction and both came to the conclusion that the rate could not be represented by the formula of the second order or by any other simple formula. Meyerhoffer ascribed the complications to the influence of the iodine formed by the reaction and proposed the equation $\frac{dx}{dt} = \frac{c(a-x)^2}{x}$, but it was shown later by Meyer⁵ that this equation is not in agreement with the experiments.

In 1890 Gactano Magnanini⁶ made a great many measurements on the rate of this reaction; he, like Ostwald, studied the influence of different acids and noted that the acceleration caused by hydrochloric, nitric and sulphuric acids is not

¹ Zeit. phys. Chem., 2, 127 (1888).

² See however, Zeit. phys. Chem., 19, 599 (1891) and Table IV of the present paper, p. 684.

³ Ibid., 2, 585 (1888).

⁴ Ibid., 2, 796 (1888).

⁵ Zeit. phys. Chem., 2, 830 (1888).

⁶ Gazz. chim. Ital., 20 377 (1890).