Summary

(1) The rate at which iodine is liberated in solutions containing potassium bromate, potassium iodide and hydrochloric acid is proportional to the concentration of the bromate, the concentration of the iodide, and the square of the concentration of the acid.

(2) In solutions containing potassium bromate, iodide, bromide and hydrochloric acid the two haloid salts are oxidized independently.

(3) The potassium triiodide formed by the oxidation of iodide adds very slightly to the rate of reduction of bromate; so that, in first approximation, the effect on the rate produced by the iodine liberated during the reaction may be neglected.

(4) Thus the progress of the reaction may be expressed by a simple differential equation (see equation 1, p. 685), which is shown to be in accordance with the experiments. A term to represent the effect due to the bromide formed during the reaction may be introduced into the equation (see equation 3).

(5) Raising the temperature 10° multiplies the rate by 1.85.

(6) The equations developed in this paper have been used to recalculate Magnanini's, Ostwald's and Noyes' measurements. (See Appendix.)

These measurements were carried out in the chemical laboratory of the University of Toronto during the winter of 1904–5; and in conclusion, I wish to express my sincerest thanks to Prof. W. Lash Miller for suggesting this research and for his supervision throughout the work.

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