TABLE X

$KBrO_3$, 20.5; KCl, 2000; KI, 98.67; HCl, 190.3

t	x	x'	x' (Sum VII and X)	x' from VIII
20	2.65	2.76	5.22	5.01
30	4.00	4.28	8.19	7.98
45	5.85	6.48	12.18	12.02
60	7.39	8.31	15.81	15.73
90	10.79	13.06	23.77	23.43

This simple relation makes it very easy to allow for the effect of the bromide which is formed from the bromate by the action of hydriodic acid. Judson and Walker have shown that the form of the equation for the rate of oxidation of bromide by bromate is the same as that of my equation 1; and the value of its constant calculated from the experiments of Table V, corrected for the high concentration of the potassium ion, and expressed in my units, is 2.2×10^{-13}.

The bromine formed by the oxidation of the bromide would, of course, react instantaneously with the potassium iodide, and liberate an equivalent amount of iodine, so that the total amount of iodine liberated in the time t is governed by the following differential equation, in which D represents the number of equivalents of bromide initially present.

$$\frac{dx}{dt}=(A-x)(C-x)^2\left[100 \times 10^{-13}(B-x)+2.2 \times 10^{-13}(D+x)\right]V^{-3}. \quad (3)$$

In all the experiments of this paper, except those in which potassium bromide was added at the beginning, D = 0, and the last term of equation (3) may be neglected.

Effect of Iodine

The only other product of the reaction which might influence the rate is iodine. In order to study its effect I undertook the experiments of Table XI in which iodine was dissolved in the stock solution of potassium iodide and its amount determined by titration.

The first column of the table gives the amount of free iodine initially present in the reacting mixture expressed in