

of arsenic acid by hydriodic acid solutions; and Series F, a set of Equilibrium determinations.

Series D.—Direct rate in the presence of hydriodic acid

In making up the reacting mixtures and in carrying out the rates the same methods were employed as are described in the former paper where sulphuric acid was employed. The method used for determining the effect of altering each constituent separately in the presence of one very small constituent, was again employed. The formula found to hold in the case of sulphuric acid was again found true, *i. e.*,

$$dx/d\theta = K_2 \frac{(A-x)(B-x)V}{(C-x)(D-x)} \quad (16)$$

and when B, C, and D are large compared with A (tri-iodine) this becomes

$$dx/d\theta = K \frac{BV(A-x)}{C^2D} = K_1 2.30(A-x). \quad (17)$$

Throughout A (tri-iodine) was the constituent present in small quantity. The integrated form where only D is assumed constant is also used and

$$K_1 = K_2 V D. \quad (18)$$

In Table 24 the constancy of K_1 is sufficient evidence that the first power of A is required in the formula and the same may be observed in each of the succeeding tables. The value of K_1 should fall off slightly on account of the slight decrease in B, C, and D; the larger decrease just at the end is due to the fact that equilibrium is being approached.

In Table 25, while the other constituents are the same as in Table 24, the iodide (C) is multiplied by the square root of 2; K_1 falls to half its value in Table 24, showing that the iodide acts inversely as its square.

In Table 27 the arsenious acid is half its concentration in Table 24, and the value of K_1 falls to half; the arsenious acid (B) acts therefore as its first power.

In Table 26, both C and D are varied but K_1 , which is independent of variations in A, B, and C, is double that of Table 24,