

Predictions of the theory

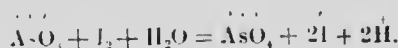
According to the theory of kinetic equilibrium, the expression $\frac{a \cdot b}{x \cdot y^2 \cdot z^2}$ must be regarded as the quotient of two others, for instance (i) $a \cdot b$ and $x \cdot y^2 \cdot z^2$, corresponding to the kinetic equations:

$$dx/dt = k_1 a \cdot b, \text{ and } -dx/dt = k_2 x \cdot y^2 \cdot z^2, \quad \text{Eqs. 5, 6}$$

Should the experiments show that the rate of oxidation of arsenious acid was proportional to the first powers of the concentrations of the AsO_3 and I_2 , the theory would require that the rate of the reverse reaction (reduction of arsenic acid by hydrogen iodide) should be in accordance with Eq. 6; and the "explanation" would be furnished by assuming that "the reactions whose rates are really measured" are those represented in Eq. 3.

But this is obviously not the only way in which the fraction in question can be divided into two factors; a number of other possibilities are enumerated in the following paragraphs.

(ii) $a \cdot b \cdot y$ and $1/x \cdot y^2 \cdot z^2$; assuming the instantaneous reaction $\text{I}_3 = \text{I}_2 + \text{I}$, this may be explained by the chemical reaction:



(iii) $a \cdot b \cdot y^2 \cdot z$ and $1/x \cdot y \cdot z$; assuming the instantaneous reactions $\text{I}_3 = \text{I}_2 + \text{I}$, and $\text{I} + \text{OH} = \text{IOH} + 2\text{H}$, this may be explained by the chemical equation:



(iv) $a \cdot b \cdot y^2 \cdot z^2$ and $1/x \cdot y \cdot z$; according to the assumptions of (iii) the following, viz.: $\text{HOI} = \text{H} + \text{OI}$, this case may be explained by:



(v) Equation 4 may be changed into the form:

¹ Some of the possible factorings obviously cannot correspond to kinetic equations. To choose an extreme case, a , and $b \cdot x \cdot y^2 \cdot z^2$.