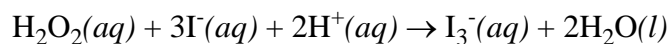


Kinetic Study of the Reaction Between H₂O₂ and I⁻

The overall stoichiometry for this reaction is



The rate of the reaction is measured by adding a very small amount of thiosulfate, S₂O₃²⁻, which reacts with the I₃⁻, converting it back to I⁻. Once all the S₂O₃²⁻ is consumed, the I₃⁻ that forms reacts with a starch indicator to give the solution a dark blue color. A buffer is included to maintain pH due to the consumption of H⁺ in the reaction. The concentration of H⁺ may affect the reaction's rate, but we will not investigate it in this experiment. The reaction's rate is

$$\text{Rate} = \frac{\Delta[\text{S}_2\text{O}_3^{2-}]}{\Delta t}$$

We might reasonably expect that the rate law has the form

$$\text{Rate} = k[\text{I}^-]^\alpha[\text{H}_2\text{O}_2]^\beta[\text{S}_2\text{O}_3^{2-}]^\gamma$$

where α , β , and γ are the reaction orders to be determined.

Run	[I ⁻] (M)	[H ₂ O ₂] (M)	[S ₂ O ₃ ²⁻] (M)	Time (s)	Rate (M/s)	Rate Constant
1	0.020	0.020	5.0×10 ⁻⁴			
2	0.020	0.040	5.0×10 ⁻⁴			
3	0.020	0.020	1.0×10 ⁻³			
4	0.040	0.020	5.0×10 ⁻⁴			
5	0.040	0.040	1.0×10 ⁻³			