

Curiosity Thread: A Slope Records What Happened, Not Why It Happened

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A concentration-time graph is a record of change. Its slope can tell us how quickly a concentration changed over a chosen interval. A steep downward reactant line and a steep upward product line are useful evidence, but neither line carries a label explaining every molecular event underneath it.

Collision theory offers one productive way to interpret a trend. Higher concentration can create more encounter opportunities, while higher temperature can change the distribution of particle energies so that more encounters may clear an energy threshold. Those are model-based explanations, and they depend on matching other conditions fairly.

That distinction is the heart of good kinetics reasoning: calculate the rate directly, state the conditions, then label the explanation as an inference. A factor between two rates does not automatically reveal a mechanism, a reaction order, or whether the products are thermodynamically more stable.