

Reaction Rate Analogy

Particles must collide to react.
 Analogy - ~50% success rate
 Reality - very low success rate.

$$\text{Rate} = \frac{\Delta \text{tokens}}{\Delta \text{time}} =$$

$$\Delta = \text{final} - \text{initial}$$

$$36 - 80$$

Factors Affecting Rate of Reaction

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1. Temperature - higher temp. \Rightarrow faster
e.g. refrigerator
2. Concentration of reactants
higher [] \Rightarrow faster
3. Surface area - more area \Rightarrow faster
e.g. kindling for a fire
4. Nature of reaction
fast e.g. explosion
slow e.g. growing plants
5. Catalyst - substance which speeds reaction.
e.g. car exhaust system.
e.g. enzymes

Kinetic Molecular Theory Explains Factors

K M Theory or Collision theory.

1. Concentration.

B - faster
greater chance of collision
2. Surface area for heterogeneous reactions
 \uparrow two or more states

S.A. = $6 \times 4 \times 4 = 24$
 S.A. = $6 \times 1 \times 8 = 48$ more S.A.
 Greater chance of collision with more S.A.

3. Nature of Reaction
 - Reacting particles must have a minimum amount of energy to react successfully.
 - Potential Energy Diagram.

Slow

slow

Exothermic

Fast

Fast

Exothermic

Rxn

Loss of energy
e.g. burning
 $\Delta H = \text{negative}$

Rxn

Gain of energy
e.g. living
 $\Delta H = \text{positive}$