Speed of Reaction

Content

Collision Theory

Temperature

- When **temperature** is **increased**, **number of reactant particles** with **$E \geq E_a$ increases**.
- **Frequency** of **EFFECTIVE** collisions **increases**.
- Since **rate of reaction** is **proportional to the frequency of effective collisions**,
- Rate of reaction **increases**.

Particle Size

- Smaller particle size results in greater surface area
- Increased frequency of effective collisions between reacting particles
- Rate of reaction increases

Pressure (Gas)/Concentration

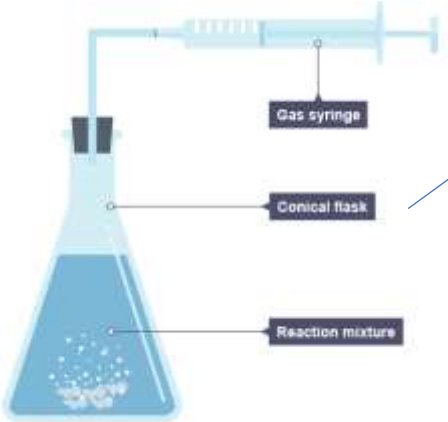
- number of reacting particles per unit volume increase
- greater frequency of effective collisions
- Greater rate of reaction

Catalyst

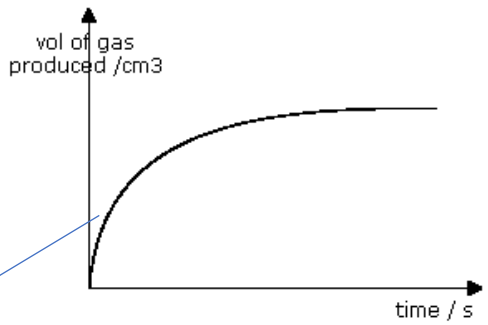
- A catalyst **increases the rate of reaction by providing an alternative reaction pathway of LOWER activation energy**.
- When a **catalyst** is **used**, **number of reactant particles with $E \geq E_a$ increases**,
- **Frequency** of **EFFECTIVE** collisions **increases**.
- Since rate of reaction is **proportional to the frequency of effective collisions**,
- Rate of reaction **increases**.

How is the rate of reaction measured?

Rate of change of volume of gas collected

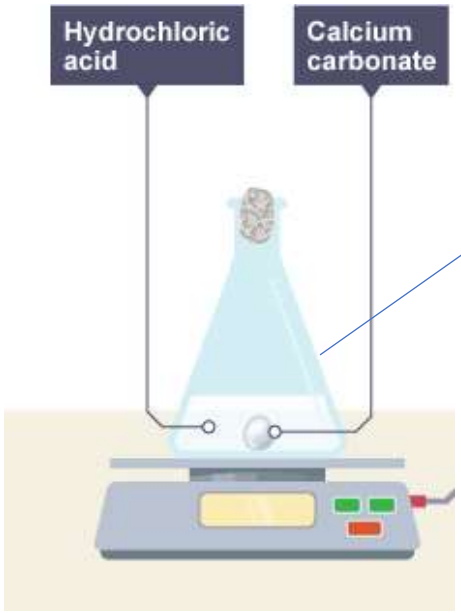


The graph would be something like this

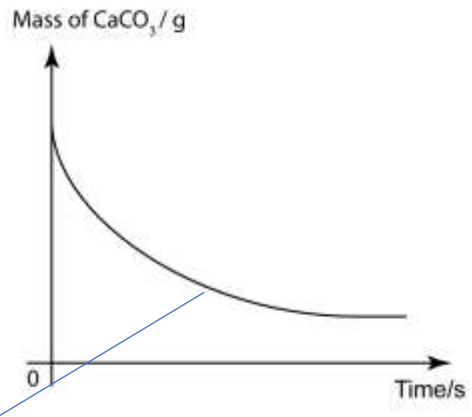


- Rate of reaction decreases after some time as the reaction proceeds as the concentration of reactants decrease

Rate of change of mass



The graph will look like this



- Rate of reaction decreases after some time as the reaction proceeds as the concentration of reactants decrease