

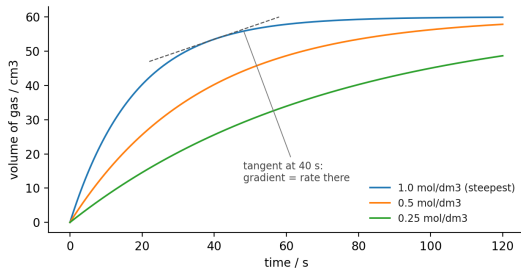
Topic 6: The rate and extent of chemical change

AQA GCSE Chemistry 8462 · spec 4.6 · sheets 6.1–6.2

How fast, how far

- Rate is a quantity per second — measured, graphed, tangented.
- Collision theory explains every factor that changes rate.
- Equilibrium decides how far a reversible reaction goes.

Measuring rates

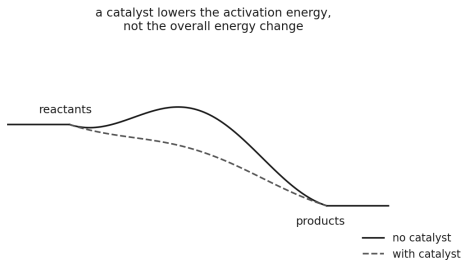


- Rate = quantity used or formed, over time.
- Units — g/s, cm³/s; higher tier mol/s.
- Steeper graph, faster reaction; tangent gradient = instantaneous rate.

Collision theory

- React — collide with at least the activation energy.
- Concentration and pressure — more frequent collisions.
- Temperature — more collisions, and more that succeed.

Catalysts



- Not used up; not in the equation; reaction-specific.
- A different pathway with lower activation energy.
- Enzymes catalyse biological systems.

Reversible reactions and equilibrium

- The double arrow; exothermic one way, endothermic the other.
- Closed system — equal forward and reverse rates.
- Concentrations constant, both reactions continue — dynamic.

Le Chatelier's principle

- A system at equilibrium counteracts a change.
- More reactant — shifts to products; more pressure — fewer gas molecules.
- Hotter — endothermic direction; a catalyst — no shift at all.

Check yourself

- Checklist before you call this topic done.
- Rates from table, graph and tangent; five factors via collision theory.
- Catalyst profile; equilibrium definition; the three condition shifts.