C6 Knowledge Organiser – Rate of reaction

Collision theory 1

- For a reaction to take place the particles of different substances **must collide**.
- Not all collisions result in a reaction.
- For a collision to be **successful**, the molecules must have a **minimum amount of energy** called the **ACTIVATION ENERGY**
- AND the particles must have the **correct orientation**
- **The more successful collisions between particles in a given time, the faster the rate of reaction.**

Factors affecting rate 2

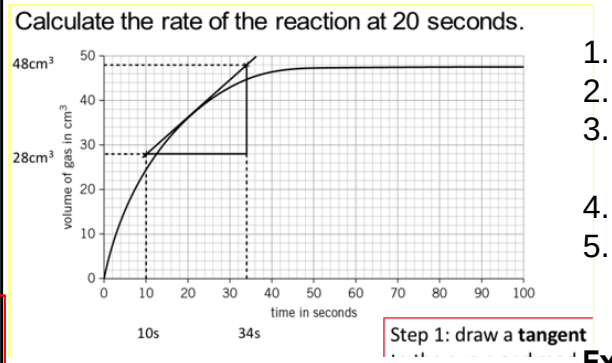
- Temperature
- Concentration
- Surface area
- Gas pressure
- Use of a catalyst

Exam tip:
When explaining how the rate of reaction is effected by one of these factors, there is a standard answer.

The mark scheme always comments on particles, number of successful collisions and the affect on the rate so remember:

- P - Particles
- C - Collisions
- R - Rate

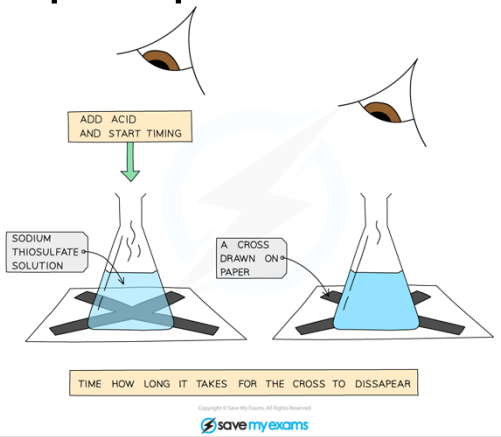
Calculating rate from a graph 3

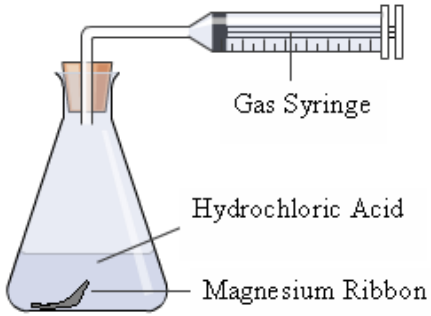


1. Draw a tangent
2. Draw triangle
3. Extend lies to intersect the x and Y axis
4. Calculate the difference
5. Difference in Y / Difference in X

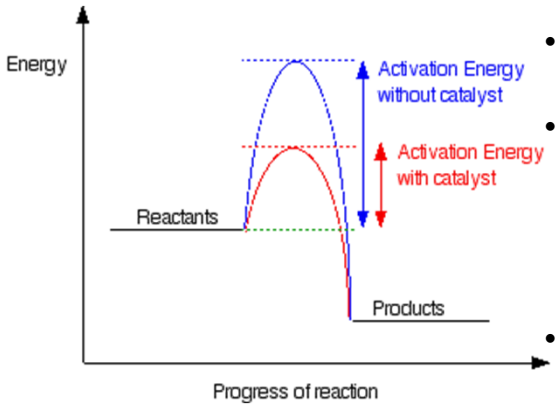
Example: 20cm³/24s = 0.83cm³/s

Required practical – Changing concentration 4





Catalysts 5



- Increases the rate of reactions.
- Not used up in the reaction.
- Decreases the energy that the particles need to collide with in order to speed up the reaction.
- Reduces the cost of a process.
- Do not affect yield.

Reversible reactions and dynamic equilibrium 6

Increase in temperature – Will shift equilibrium in the endothermic direction to lower the temperature

Decrease in temperature - Will shift equilibrium in the exothermic direction to increase the temperature

Increase in pressure – Will shift equilibrium to the side will the fewest gas molecules to decrease the pressure

Decrease in pressure – Will shift equilibrium to the side with the most gas molecules to increase the pressure

You must describe which direction the equilibrium will move in – left or right

Explain the reason for this

Explain the effect this will have on the yield