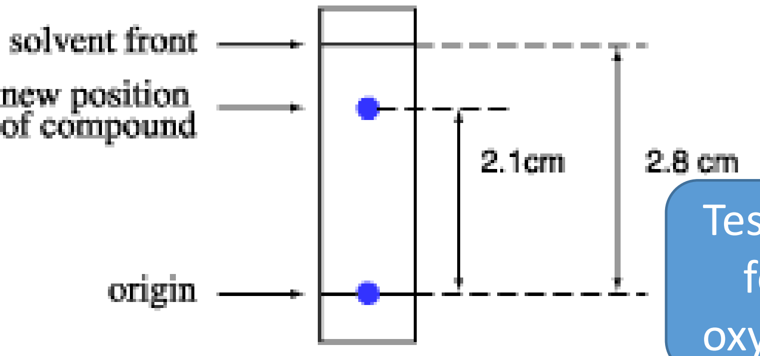
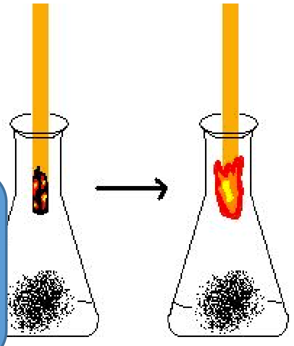
Knowledge Organiser – Chemical Analysis

Pure substance	A single element or compound that is not mixed with any other substance.
Formulation	A mixture that has been designed as a useful product.
Chromatography	A technique that can be used to separate mixtures and the identify substances.

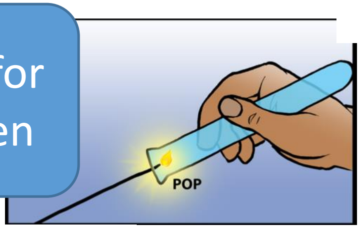


$$R_f = \frac{2.1}{2.8} = 0.75$$

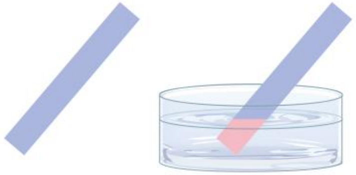
Testing for oxygen

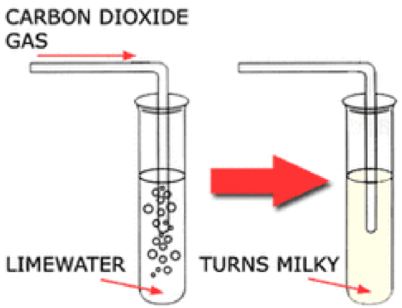


Testing for hydrogen



Testing for chlorine using litmus paper





Testing for CO_2

Knowledge Organiser – Chemical Analysis

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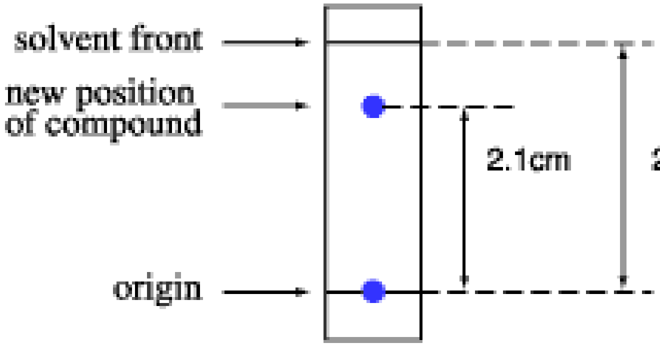
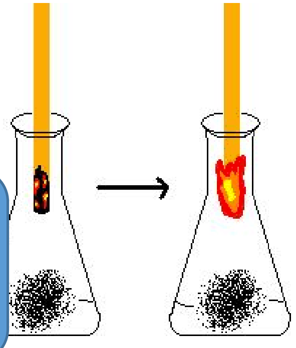
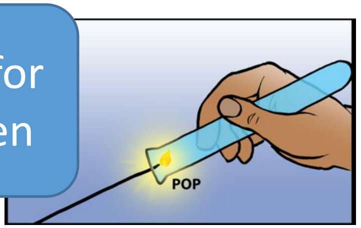


$$R_f = \frac{2.1}{2.8} = 0.75$$

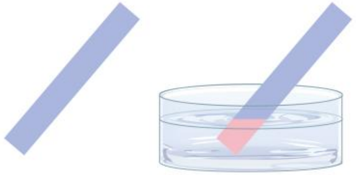
Testing for oxygen



Testing for hydrogen



Testing for chlorine using litmus paper



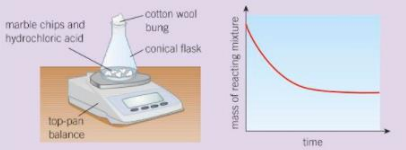
Testing for CO_2

Pure substances and mixtures

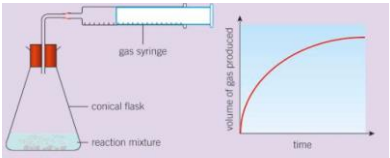
To measure the rate of a reaction you can:

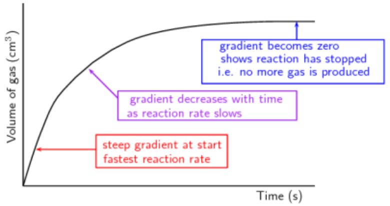
- **Measure how fast the reactants are used up**
- **Measure how fast the products are made**

e.g. Measure mass lost due to gas formed



e.g. Measure volume of gas made

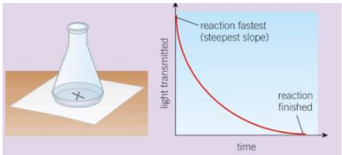




Rate = volume of gas ÷ time

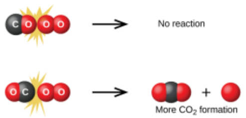
cm^3/s

e.g. Measure time for insoluble product to form



C12 Chemical Analysis

Chromatography



A successful collision is one that leads to a reaction

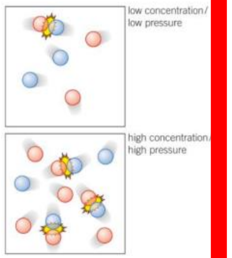
So to increase the rate of a reaction you must either

- **Increase the frequency of collisions**
- **Increase the energy of the collisions**
- **Decrease the energy needed for a collision to be successful**

Gas tests

Concentration and Pressure

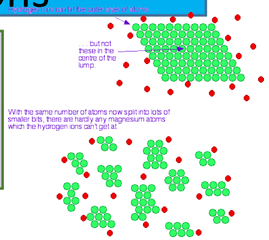
More particles in the same space.
More frequent collisions



TRIPLE ONLY

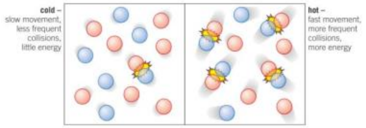
Tests for Positive ions

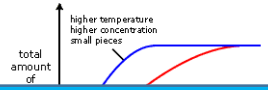
More particles available to react.
More frequent collisions



Temperature

Particles **move faster**.
So they **collide more frequently**.
Particles collide **with more energy**.
So more of the collisions are **successful**.

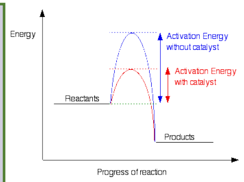




Tests for Negative ions

Catalysts

Lower the energy needed for successful collisions. (Activation energy)
Not used up.
Biological catalysts are called **enzymes**

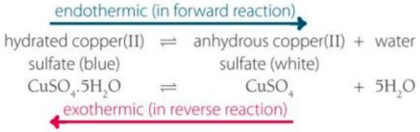


Instrumental Analysis

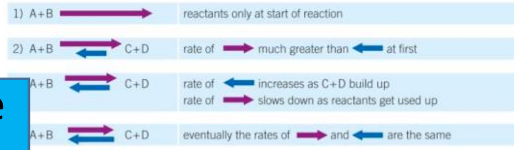
Can go in both directions.

$$A + B \rightleftharpoons C + D$$

If a reaction is exothermic in one direction it is endothermic in the other direction.



In a **closed system** (where nothing can get in or out) an **equilibrium** is reached where the **rate of reaction is the same in both directions**.



At equilibrium:

- Rate of forward reaction = rate of reverse reaction.
- Mount of products and reactants don't change.