

Edexcel Chemistry GCSE

CP 6 - Investigating Reaction Rates

Flashcards

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How can the rate of a reaction be measured (3 ways)?



How can the rate of a reaction be measured (3 ways)?

Measure change in mass

Measure the volume of gas produced
(upside-down measuring cylinder or gas syringe)

Observe colour change/ precipitate formed



When can the change in mass be used to measure the rate of a reaction? Why?



When can the change in mass be used to measure the rate of a reaction? Why?

When a gas is produced.

Gaseous molecules will be lost from the reaction vessel so fewer atoms in the reaction mixture.

Mass will decrease.



How do you calculate the rate of reaction?



How do you calculate the rate of reaction?

Rate of Reaction =

$$\frac{\text{Amount of product formed or reactant used}}{\text{Time}}$$



Marble chips are added to HCl. How can the rate of reaction be measured?



Marble chips are added to HCl. How can the rate of reaction be measured?

Measure the volume of gas produced (gas syringe or upside-down measuring cylinder) and record the time



Why must you be careful when measuring the volume of gas produced using a gas syringe?



Why must you be careful when measuring the volume of gas produced using a gas syringe?

You must ensure the volume produced will fit within the syringe otherwise it could damage the equipment and cause harm to the user



Why must the bung be immediately attached to the reaction vessel when measuring volume of gas produced?



Why must the bung be immediately attached to the reaction vessel when measuring volume of gas produced?

To ensure minimal gas escapes



Name 3 ways the rate of reaction between HCl and marble chips could be increased



Name 3 ways the rate of reaction between HCl and marble chips could be increased

Increased surface area of marble chips

Increased concentration of acid

Increased temperature of reactants



Dilute HCl is added to sodium thiosulfate. How can the rate of reaction be measured?



Dilute HCl is added to sodium thiosulfate. How can the rate of reaction be measured?

- Place piece of paper with a black cross below the reaction vessel and observe this cross through the solution
- Measure how long it takes for the cross disappear



Why is the precipitate rate experiment not very reliable?



Why is the precipitate and colour change rate experiment not very reliable?

It is very subjective - people might disagree over the exact point when the mark disappears or the solution changes colour



How can you determine the rate of a reaction at a particular time?



How can you determine the rate of a reaction at a particular time?

Plot results on a graph

Draw a tangent to the curve at this time

Calculate the gradient (change in $y \div$
change in x)



Write a chemical equation for the reaction between HCl and marble chips (CaCO_3)



Write a chemical equation for the reaction between HCl and marble chips (CaCO_3)



How do you know that a reaction is complete?



How do you know that a reaction is complete?

Mass of reaction mixture/ volume of gas/
colour remain the same



How does temperature affect the rate of a reaction? Why?



How does temperature affect the rate of a reaction? Why?

Increasing temperature increases the rate because particles have more kinetic energy so move faster (more frequent collisions) and more particles have energy above the activation energy (more collisions are successful).



How does concentration of reactants affect the rate of a reaction? Why?



How does concentration of reactants affect the rate of a reaction? Why?

Increasing concentration increases the rate because there are more particles in the same volume so there are more frequent successful collisions.



How does pressure of reactants affect the rate of a reaction? Why?



How does pressure of reactants affect the rate of a reaction? Why?

Increasing pressure increases the rate because there are more particles in the same volume (or the same number of particles in a smaller volume) so there are more frequent successful collisions.

