

Definitions and Concepts for AQA Chemistry GCSE

Topic 6 - The Rate and Extent of Chemical Changes

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Definitions have been taken, or modified from the [AQA Specification for GCSE Chemistry, 8462, Version 1.1 04 October 2019](#).

Activation energy: The minimum amount of energy that particles must collide with to react.

Catalyst: Catalysts increase the rate of reaction by providing a different pathway for the reaction that has a lower activation energy. They are not used up during the reaction.

Collision theory: According to this theory, chemical reactions can occur only when reacting particles collide with each other and with sufficient energy.

Effect of changing concentration on equilibrium: If the concentration of a reactant is increased, more products will be formed until equilibrium is reached again. If the concentration of a product is decreased, more reactants will react until equilibrium is reached again.

Effect of changing pressure on equilibrium: An increase in pressure causes the equilibrium position to shift towards the side with the smaller number of molecules. A decrease in pressure causes the equilibrium position to shift towards the side with the larger number of molecules.

Effect of changing temperature on equilibrium: If the temperature of an equilibrium system is increased then the relative amount of products at equilibrium increases for an endothermic reaction and decreases for an exothermic reaction.

Effect of concentration on reaction rate: Increasing the concentration of reactants in solution means the reacting particles will be closer together. This means they will collide more often so there will be a higher rate of successful collisions and a faster rate of reaction.

Effect of pressure on reaction rate: Increasing the pressure of gaseous reactants means the reacting particles will be closer together. This means they will collide more often so there will be a higher rate of successful collisions and a faster rate of reaction.



Effect of surface area on reaction rate: Increasing the surface area of the reactants means there are more exposed reacting particles. This means there are more frequent successful collisions so the rate of reaction increases.

Effect of temperature on reaction rate: Increasing the temperature means the particles will have more kinetic energy and so will move faster. If the molecules are moving faster they will collide more often and, since they've gained kinetic energy, a larger proportion of the particles will have at least the activation energy. For both these reasons the rate of reaction increases.

Equilibrium: When a reversible reaction occurs in apparatus which prevents the escape of reactants and products, equilibrium is reached when the forward and reverse reactions occur at exactly the same rate.

Le Chatelier's Principle: If a reaction at equilibrium is subjected to a change in concentration, temperature or pressure, the position of equilibrium will move to counteract the change.

Rate of reaction: The measure of the amount of product formed or reactant used over time. The units of rate of reaction may be given as g/s, cm³/s or mol/s.

Reversible reaction: Reactions in which the products from the reaction can react together to form the original reactants. The direction of reversible reactions can be changed by changing the conditions.

