

Definitions and Concepts for WJEC (Eduqas) Chemistry GCSE

Topic 9 - Rate of Chemical Change and Dynamic Equilibrium

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

Definitions have been taken, or modified from the [WJEC \(Eduqas\) Specification for GCSE Chemistry, C410, Version 3 January 2019](#)

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

Catalyst: Increases the rate of reaction by providing a different reaction pathway with a lower activation energy. They are not used up during the reaction.

Dynamic equilibrium: Reached by a reversible reaction when the rate of the forward reaction is equal to the rate of the backward reaction. At dynamic equilibrium, the concentration of reactants and products remains constant.

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

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.

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Effect of temperature on equilibrium: An increase in temperature will shift the equilibrium position in the direction of the endothermic reaction. A decrease in temperature will shift the equilibrium position in the direction of the exothermic reaction.

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.

Enzymes: Biological catalysts which speed up biochemical reactions so that organisms can survive. They are used in the production of alcoholic drinks.

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.

Precipitation reaction: A reaction in which solutions react to form an insoluble product.

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: A reaction in which the products can react together to reform the reactants. Reversible reactions are denoted by the symbol \rightleftharpoons .

