

## Definitions and Concepts for Edexcel Chemistry GCSE

### Topic 7 - Rates of Reaction and Energy 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 [Edexcel Specification for GCSE Chemistry, 1CH0, Issue 3, February 2018](#)*

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

**Catalyst:** 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:** Chemical reactions only occur when colliding particles collide with the correct orientation and with sufficient energy.

**Displacement:** A chemical reaction in which a more reactive element displaces a less reactive element from its compound.

**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.

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**Endothermic reaction:** A reaction that takes in energy from the surroundings so the temperature of the surroundings decreases. In an endothermic reaction, the energy needed to break existing bonds is greater than the energy released from forming new bonds.

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

**Exothermic reaction:** A reaction that transfers energy to the surroundings so the temperature of the surroundings increases. In an exothermic reaction, the energy released from forming new bonds is greater than the energy needed to break existing bonds.

**Neutralisation:** The reaction in which an acid and a base react to form a salt and water.

**Overall energy change of the reaction:** The difference between the sum of the energy needed to break bonds in the reactants and the sum of the energy released when bonds in the products are formed.

**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, cm<sup>3</sup>/s or mol/s.

**Reaction profile:** Graphs used to show the relative energies of reactants and products, the activation energy and the overall energy change of a reaction.

