

# Definitions and Concepts for OCR (B) Chemistry GCSE

## Topic 1 - Air and Water

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

Definitions marked by '\*' are for separate sciences only

Definitions have been taken, or modified from the [OCR \(B\) Specification for GCSE Chemistry, J258, Version 3.2 April 2020](#)

**Acid rain:** Rain that is acidic due to gases, such as sulfur dioxide, reacting with water vapour in the clouds. Sulfur dioxide is produced from the burning of fossil fuels which contain sulfur impurities.

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

**Aeration:** A process used in the process of making water potable. Air is passed through the water so that any dissolved gases are released. It also removes any volatile compounds and causes iron and manganese minerals to precipitate out of the solution.

**Carbon capture:** A process used to reduce carbon dioxide emissions by trapping the carbon dioxide at the emission source and then storing it underground. This prevents the carbon dioxide from being released into the atmosphere.

**Catalytic converter:** A device fitted in a car to reduce the amount of emissions from an internal combustion engine. They use expensive metals like platinum and rhodium as the heterogeneous catalyst. The catalyst is mounted on a ceramic honeycomb to maximise the surface area.

\***Chemical cell:** A cell which converts chemical energy to electrical energy. They are made up of two metal electrodes connected by an electrolyte. The cell produces a voltage until one of the reactants is used up.

**Chemical change:** Require a chemical reaction and the products must have a different chemical composition to the reactants.

**Chlorination:** A process used in water treatment where chlorine gas is injected into the water to kill any microbes.

**Climate change:** A change in global climate patterns largely believed to be caused by the increase in concentration of carbon dioxide in the atmosphere.

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**Combustion:** The burning of a substance in oxygen. If there is sufficient oxygen present for the substance to burn then it is called complete combustion. Energy is transferred to the surroundings as heat and light.

**Complete combustion:** Combustion carried out in sufficient oxygen. Water and carbon dioxide are the only products of the complete combustion of a hydrocarbon.

**Distillation:** The process of separating a mixture of liquids by their different boiling points. The solution is heated so that the liquid with the lowest boiling point evaporates. The gas is then cooled and collected from a condenser. Distillation can be used to remove salt from sea water.

**Endothermic reaction:** A reaction which takes in energy from the surroundings so the temperature of the surroundings decreases.

**Exothermic reaction:** A reaction which transfers energy to the surroundings so the temperature of the surroundings increases.

**Filtration:** A separation technique used to separate an insoluble solid from a solution.

**Fossil fuels:** Natural fuels, such as coal and gas, formed in the past from the remains of living organisms. Fossil fuels are non-renewable.

**\*Fuel cell:** An electrochemical cell which continuously produces a voltage when supplied with a fuel and oxygen. The fuel donates electrons at one electrode and oxygen gains electrons at the other electrode.

**Gas:** The state of matter where the particles have the most energy. The particles in a gas are relatively spread out and move randomly in all directions.

**Greenhouse effect:** The increase in the temperature of the Earth's atmosphere due to the greenhouse gases in the atmosphere trapping infra-red radiation from the surface.

**Greenhouse gases:** Gases in the atmosphere which maintain temperatures on Earth high enough to support life. Greenhouse gases include water vapour, carbon dioxide and methane.

**Ground water:** Water which collects in rocks that then trap the water underground.

**\*Hydrogen-oxygen fuel cell:** A fuel cell in which hydrogen and oxygen are the reactants used to produce a voltage. Water is the only product. The overall reaction for the hydrogen-oxygen fuel cell is:  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$

**Incomplete combustion:** Combustion which is carried out with insufficient oxygen. It can lead to the production of toxic carbon monoxide and carbon particulates.



**Liquid:** The state of matter where the particles are arranged randomly and close together. The particles are able to move past each other.

**Membrane filtration:** A type of filtration which can separate particles in liquid or gas mixtures. There is a semi-permeable membrane which only allows smaller sized particles to pass through it. External pressure is applied so that the molecules move from an area of low concentration to an area of high concentration. This process is used in the process of making water potable.

**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.

**Oxidation:** A reaction which involves the gain of oxygen.

**Particle model:** Models the three states of matter by representing the particles as small solid spheres. The particle model can help to explain melting, boiling, freezing and condensing.

**Particulates:** Polluting particles which cause global dimming and health problems for humans. Carbon particulates (soot) are a product of incomplete combustion.

**Physical change:** Requires energy and involves a change in state. The form of the chemical is changed but the chemical composition remains the same.

**Potable water:** Water that is safe for humans to drink.

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

**Reforestation:** A process used to reduce carbon dioxide levels in the atmosphere by planting more trees. The trees will take in the carbon dioxide for photosynthesis.

**Scrubber system:** A pollution control system which removes pollutants from exhausts before they are released into the atmosphere, helping to reduce emissions.

**Solid:** The state of matter where the particles hold a regular arrangement and have the least amount of energy.

**Waste water:** Water from industrial, domestic, agricultural and commercial activity. It requires treatment before it is potable.

