

# Definitions and Concepts for WJEC (Wales) Chemistry GCSE

## Topic 1.3 - Water

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

Definitions have been taken, or modified from the [WJEC \(Wales\) Specification for GCSE Chemistry. 3410. Version 2 March 2019](#)

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

**Desalination:** The process of removing salt from seawater.

**Distillation:** A separation technique used to separate liquids from a solution. Simple distillation is used to separate two liquids from a solution, whereas fractional distillation can separate a mixture of liquids into different fractions.

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

**Fluoridation of water:** The process of adding fluoride to water to help to prevent tooth decay.

**Fractional distillation:** A process used to separate a mixture of liquids. The liquids have different boiling points so can be separated into different fractions within a fractionating column. The mixture of liquids is vaporised before the gases enter the fractionating column, where they condense at different fractions.

**Hard water:** Water which contains dissolved magnesium ions and calcium ions. The ions are absorbed when the water runs over rocks such as limestone. When soap is added to hard water it is difficult to form a lather as scum is formed as a product.

**Ion exchange:** A process which can be used to soften hard water. A column is packed with resin containing sodium ions. The hard water is allowed to flow through the column, where the magnesium and calcium ions are exchanged for sodium ions. This removes the calcium and magnesium ions, making the water soft.

**Permanent hard water:** Hard water in which the hardness can not be removed by boiling. The hardness is caused by dissolved calcium sulfate ( $\text{CaSO}_4$ ).

This work by [PMT Education](#) is licensed under [CC BY-NC-ND 4.0](#)



**Sedimentation:** A process used in water treatment to remove solids from the water. Suspended solids will fall to the bottom of the container and form a sediment, allowing them to be easily removed.

**Simple distillation:** A separation technique used to separate a liquid from a solution. The solution is heated so that only the liquid with the lowest boiling point evaporates. This gas is then condensed in a condenser before being collected as a liquid.

**Soft water:** Water which contains low concentrations of ions such as calcium and magnesium ions. When soap is added to soft water it will easily form a lather.

**Solubility:** The ability of a solute to dissolve in a solvent. It depends on the solute, solvent and temperature and is often measured as the maximum mass of a solute which can be dissolved in 100 g of solvent at a certain temperature.

**Temporary hard water:** Hard water in which the hardness can be removed by boiling. It is hard water which is caused by dissolved calcium hydrogen carbonate ( $\text{Ca}(\text{HCO}_3)_2$ ). When heated, calcium hydrogen carbonate thermally decomposes to produce limestone, water and carbon dioxide.

**Water softening:** Processes used to remove ions from hard water so that it is turned into soft water. Processes include use of an ion exchange column, the addition of sodium carbonate or distillation.

