

SEPARATING TECHNIQUES MIXTURES

Two or more unbonded substances that can be separated by physical change reactions

GAS

the air we breathe is a MIXTURE of mostly nitrogen and oxygen

nitrogen is not useful so the lungs act like a FILTER absorbing the oxygen and breathing the nitrogen back out

LIQUID

liquids can be separated by EVAPORATION due to different boiling points...

...or by dissolving in solvents as different particles travel at different speeds

SOLID

iron is attracted to magnetic fields so CAN be separated from sulfur in a solid MIXTURE

iron sulfide is chemically bonded in a compound so a magnet CANNOT attract the iron from a solid COMPOUND

SEPARATING TECHNIQUES SOLUTIONS

A liquid mixture where one substance has been dissolved and spread throughout another

HETEROGENOUS

mixture with an UNEVEN composition

ice and water are in different phases so are an example of a heterogenous mixture but NOT a solution

dissolving

water particles separate all of the salt particles and spread them evenly to form an AQUEOUS SOLUTION

HOMOGENOUS

mixture with an EVEN composition

SEPARATING TECHNIQUES FILTRATION

Using a filter to separate solid particles that are not dissolved by the liquid they are in

solid mud gets stuck in filter paper

liquid water passes through

COLLOID

insoluble solid dispersed evenly through a liquid e.g. muddy water

the kidneys filter the blood to allow dissolved waste to escape the blood stream

solid blood cells stay in blood vessels, urine passes through

SEPARATING TECHNIQUES CRYSTALLISATION

Using evaporation to separate solid particles from the liquid they have been dissolved into

sodium chloride, a salt, where sodium and chlorine atoms are arranged regularly in a lattice so form a crystalline structure

GEODE mineral solution cools into crystals

water vapour evaporates off

saltwater solution

gentle heating builds bigger crystals than rapid heating

SEPARATING TECHNIQUES CHROMATOGRAPHY

Using solvents to separate and identify the different parts of fluid mixtures, liquid or gas

baseline in pencil as pencil doesn't travel up the paper

different dyes in each ink travel up the paper at different rates causing them to separate out and be identified

samples of substances e.g. different ink

chromatography paper is highly absorbent; called the STATIONARY phase

solvent level below the base line

a SOLVENT is a liquid that can dissolve the sample substances and carry them up the paper; this is the MOBILE phase

SEPARATING TECHNIQUES DISTILLATION

Using evaporation to separate two or more liquids with different boiling points from each other

mixture of alcohol and impurities that are dissolved in water

impure alcohol

HEAT

pure alcohol has a lower boiling point than water, so only the alcohol evaporates, travels through the tube and condenses in the test tube

FRACTIONAL DISTILLATION

separates a liquid mixture, such as crude oil, into many parts, such as petrol or natural gas

natural gas

petrol

naptha

kerosine

diesel

bitumen

crude oil

HEAT

COOL!