Intellitive formula mass Relative formula mass, Ar. is the average mass of a unit of a substance compared to 1/12 of an atom of ¹² C Calculate relative formulae The chemical formula tells us how many atoms of each element there are in a compound. Calculate the empirical formula To calculate the relative formula mass, and together the relative atomic masses of each atom in a formula. Calculate the empirical formula of a compound The empirical formula tills us how many atoms of each element there are in a compound. Calculate the empirical formula is the simplest whole number ratio of atoms of each element in a formula. To calculate the empirical formula of a chemical formula by the highest common factor is 2. If we have a a diagram of the molecule then umbers in the chemical formula of a chemical by countin up the number of atoms of each element in the molecule and then dividing by the highest common factor. Calculate relative formula masses In a balanced chemical equation, the sum of all of the relative formula masses of the products. We can use this to calculate the relative formula masses of a substance is one that and subclust. Explain what purity means A pure substance is one that contains only one type of element or compound. Explain that many useful materials Mixtures are impure and alloys. Alloys are mixtures of more than one element, of which at least om must be a metal. Alloys are useful because their properties are different from the elements that make up the distinguish pure substances form Use melting point data to	Learning Objectives	Keypoints
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Describe and explain how simple distillation and fractional distillation work	Distillation works because different liquids have different boiling points. In simple distillation a solvent is separated from a solution. This works because if the solvent has a much lower boiling point that the solute. Therefore the solvent boils when the solution is heated, but the solute does not and is left behind in the flask. A condenser is used to cool the evaporated solvent and condense it to give the liquid. Fractional distillation separates two or more liquids. The setup is the same as distillation except a fractionating column is used to help separate the liquids out better.
Describe how paper and thin- layer chromatography work	All types of chromatography have a stationary phase and a mobile phase. Compounds are separated using chromatography as different compounds will have different preferences for the stationary and mobile phases. If a compound prefers the mobile phase then it will travel further, if it favours the stationary phase then it will travel a shorter distance. In paper chromatography the stationary phase is paper and the mobile phase is a solvent – usually but not
	always water. Each component of the mixture will produce a different spot. In thin layer chromatography, the stationary phase is a thin layer of silica or alumina powder over a plastic or glass plate.
Calculate retention factor (Rf) values from chromatograms	Rf = (distance travelled by substance) ÷ (distance travelled by solvent)
Describe how gas chromatography works	In gas chromatography, the mobile phase is a carrier gas such as nitrogen. The carrier gas needs to be unreactive.
	The stationary phase is silica or alumina packed onto a metal column. Each component will have a different retention time. The area under the peak is proportional to the amount of substance present.
Suggest suitable chromatography methods for distinguishing pure from impure substances	Paper chromatography is cheaper than thin layer chromatography, but tlc is quicker and more sensitive. There is also more choice of stationary and mobile phases as different tlc plates and solvents can be used.
Suggest suitable purification methods when given information about the substances involved	To separate a soluble solid from a solvent: If you want to isolate the solid then use crystallisation, if you want to isolate the solvent then use simple distillation. To separate an insoluble solid from a soluble solid dissolve the soluble solid and then filter to remove the
	insoluble solid. To separate two or more liquids use fractional distillation. To separate 2 or more soluble solids use paper chromatography or thin layer chromatography.
	Keywords:
crystallisation, dissolves, empirical impure substance, insoluble, melti	ation, boiling point, carrier gas, chemical formula, chromatography, chromatogram, condensed, condenser, formula, evaporates, filtrate, filtration, fraction, fractional distillation, fractionating column, gas chromatography, ing point, mixture, mobile phase, paper chromatography, periodic table, phases, pure substance, purity, relative residue, saturated solution, simple distillation, solubility, soluble, solute, solution, solvent, stationary, phase, thin

atomic mass, relative formula mass, residue, saturated solution, simple distillation, solubility, soluble, solute, solution, solvent, stationary phase, thin layer chromatography, vapour

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