

Chapter 6 – Separation techniques

Question	Answers	Extra information	Mark
1(a)	Correctly labelled: Round-bottomed flask, beaker, condenser, thermometer	1 mark for each correctly labelled piece of apparatus	4
(b)	in the beaker		1
2	water soluble funnel salt water sand insoluble		1 1 1 1 1 1
3	solvent – the liquid in which a substance is dissolved solute – the substance that dissolves in a liquid solution – a solid or gas dissolved in a liquid dissolving – the process of mixing a solute and a solvent to make a solution	2 marks for two correctly matched 1 mark for one correctly matched	3
4(a)	label added along the horizontal section of the graph		1
(b)	a substance that has no other substances mixed with it		1
5(a)	Any three from: <ul style="list-style-type: none"> place a spot of the mixture near the bottom of a piece of chromatography paper place the bottom of the filter paper in a beaker containing a little solvent, below the level of the spot allow the solvent to rise up the paper solutes in the mixture will rise up the paper to different heights 		3
(b)	B the spots from the unknown pen are at the same height/distance from the bottom as that sample		1

Question	Answers	Extra information	Mark
(c)	finding the colours used in sweets/food products/finding the pigments present in a leaf	Allow any other use of chromatography	1
6(a)i	B		1
(a)ii	sugar particles are randomly positioned and mixed with/surrounded by water particles		1
(b)	165 g		1
(c)	the maximum mass of a solute that will dissolve/a solution in which no more solute will dissolve at that temperature		1 1
7(a)	cooling down/decreasing temperature		1
(b)	57 [°C]/58 [°C] this is the point the graph is horizontal/where the temperature does not change		1 1
(c)	the (solid) stearic acid cools until it reaches room temperature		1 1
8	<p>Similarities:</p> <ul style="list-style-type: none"> • both contain atoms of more than one element • both can be separated <p>Differences:</p> <ul style="list-style-type: none"> • the substances are not joined together in mixtures • in compounds, the atoms of the elements are joined together chemically • the substances keep their own properties in mixtures • the properties of a compound are different to those of its elements • the amounts of substances can be changed in mixtures • the relative amounts of the elements in a compound cannot change • mixtures are normally easy to separate • compounds can only be separated by chemical reactions 	1 mark for each correct statement To achieve full marks, at least one similarity must be stated	6

Question	Answers	Extra information	Mark
9	<p>Any six from:</p> <ul style="list-style-type: none"> • mixture placed in a (round-bottomed) flask • mixture is heated • ethanol reaches its boiling point first/at 78 °C/at a lower temperature than the boiling point of water • molecules of ethanol leave the surface of the liquid/ethanol evaporates/ethanol liquid becomes ethanol vapour • molecules of water remain liquid/do not change state • ethanol vapour molecules rise and enter the condenser • condenser cools the ethanol vapour molecules (to below 78 °C) • changing the ethanol vapour back to a liquid/causing ethanol vapour to condense • pure liquid ethanol leaves the condenser 	<p>Accept particles for molecules Accept gas for vapour</p>	6
10(a)	<p>the higher the temperature, the higher the solubility solubility increases at an ever-increasing rate</p>		1 1
(b)	33 °C/34 °C		1
(c)	<p>Any two from:</p> <ul style="list-style-type: none"> • solubility of A increases with temperature, but solubility of B decreases • solubility of A changes more across the temperatures tested than solubility of B/solubility of A is more affected by temperature than solubility of B • rate of change of solubility of A increases with temperature, but rate of change of solubility of B decreases with temperature 		
SPACED LEARNING QUESTIONS			
11(a)	<p>Any two from:</p> <ul style="list-style-type: none"> • high melting point • sonorous • ductile 		2

Question	Answers	Extra information	Mark
(b)	forms an acidic oxide		1
(c)	to the right of the stepped line		1
12	A – mixture contains different types of atom, not all joined together B – compound contains different types of atom joined together C – element only contains one type of atom		1 1 1 1 1 1