2.6 Separating Mixtures and Solutions: Test Pack

Calculator allowed · about 15 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Name the substance in a solution that is dissolved and the substance that does the dissolving. Example: sugar dissolved in water.

(1)

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2 A student uses filtration to separate a mixture of charcoal fines and salt solution. After filtering, the student notices the filtrate is slightly cloudy. The student suspects fine charcoal particles passed through the filter. Answer the parts below.

(a) Give two possible mistakes the student could have made that would allow charcoal to pass through the filter. **(2)**

(b) Suggest three improvements the student could make to obtain a clear filtrate. **(3)**

(c) If the student wanted to obtain pure salt from the clear filtrate, outline the main steps they should follow after obtaining the clear solution. (Max 3 steps.) **(3)**

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3 A student adds small scoops of salt to 100 g of water at 20°C until no more salt dissolves and extra salt stays as grains on the bottom. State what is meant by a saturated solution, and use this experiment to give one sentence that shows the solution is saturated.

(2)

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4 Chromatography is used to separate the different dyes in a black ink pen. Explain the role of the solvent in paper chromatography.

(3)

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Mark scheme · 2.6 Separating Mixtures and Solutions: Test Pack

Question 1

solute and solvent, in either order, cao — **B1**

Answer: **solute; solvent**

Question 2

(a) filter paper folded incorrectly or wrong pore size (eg too large) — **B1**

(a) filter not wetted/secured so mixture bypassed the paper or pouring too quickly causing particles to be pushed through — **B1**

(a) Answer: **Possible mistakes: using filter paper with pores too large or folding/setting the paper incorrectly; pouring too quickly so particles pass through or not wetting the paper so it does not seal.**

(b) use finer filter paper or a filter funnel with smaller pores — **M1**

(b) pour slowly and in small portions, or pre-wet the filter paper to create a seal — **M1**

(b) mention alternate methods such as decanting before filtration or using centrifuging or using multiple filtration steps to remove fine particles — **A1**

(b) Answer: **Use finer filter paper and pour slowly in small portions, pre-wetting the paper so it seals; alternatively decant and re-filter or use centrifuging to remove fine particles.**

(c) evaporate or gently heat the filtrate to concentrate it — **M1**

(c) leave to cool so crystals form — **M1**

(c) collect and dry the crystals or scrape and dry the crystals (eg remove and dry crystals) cao — **A1**

(c) Answer: **Gently evaporate the filtrate to concentrate it, leave to cool so salt crystals form, then collect and dry the crystals.**

Question 3

definition that no more solute will dissolve at that temperature or solution contains the maximum amount of solute for that temperature — **M1**

reference to the experiment such as "extra salt stays undissolved on the bottom" or "adding more salt does not dissolve" cao — **A1**

Answer: **A saturated solution contains the maximum amount of solute that can dissolve at that temperature; in the experiment the extra salt stays undissolved on the bottom so the solution is saturated.**

Question 4

solvent moves up the paper carrying the dye mixture — **M1**

different dyes dissolve to different extents or travel at different speeds in the solvent — **M1**

so components separate because of different solubility or different attraction to the paper and solvent cao — **A1**

Answer: **The solvent moves up the paper carrying the dyes; different dyes dissolve differently and travel at different speeds, so they separate on the paper**

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