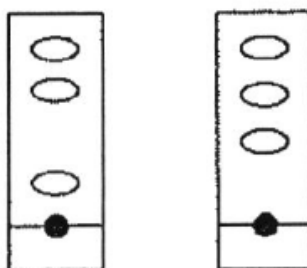


O Level Pure Chemistry MCQs

Separation Techniques Test 1.0

Q1

Two groups of students were investigating the type of pigments found in flower petals. After obtaining a solution from the petals, separation of the pigments was performed using chromatography. The chromatograms obtained are shown below.



If both groups of students used flowers from the same plant, why were the chromatograms different?

- A One group of students did not use enough solvent.
- B The solvent moved up the paper at different speed.
- C The two groups of students used different solvents.
- D The solvent in one of the separation did not reach the top of the paper.

Q2

The properties of two substances are shown in the table below.

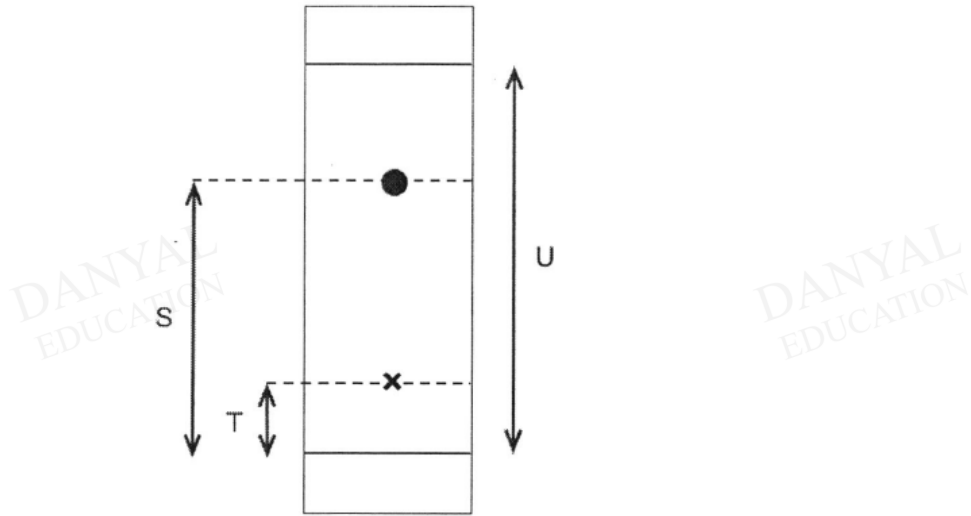
substance	melting point (°C)	boiling point (°C)	solubility in water
1	-8	67	insoluble
2	95	210	soluble

Which is the best method to separate these two substances at room temperature and pressure?

- A filtration
- B paper chromatography
- C separating funnel
- D simple distillation

Q3

A substance is marked on a piece of filter paper at the point marked X, and placed in a solvent for some time. The resulting chromatogram is obtained.

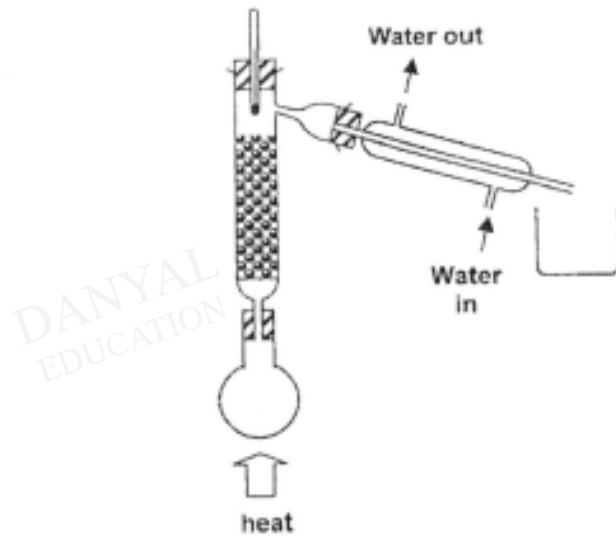


What is the R_f value of the dot obtained?

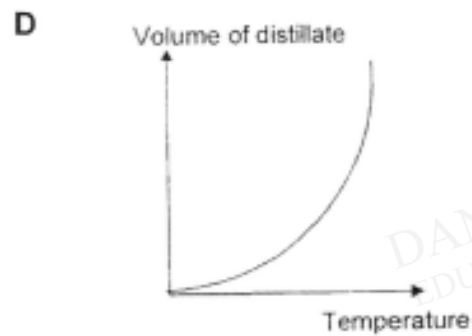
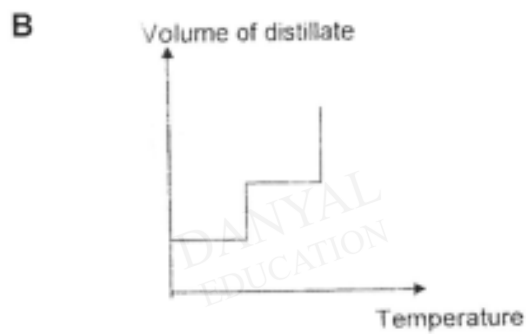
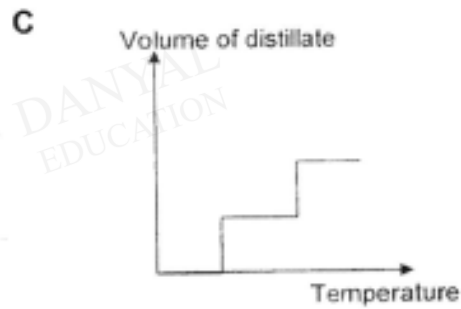
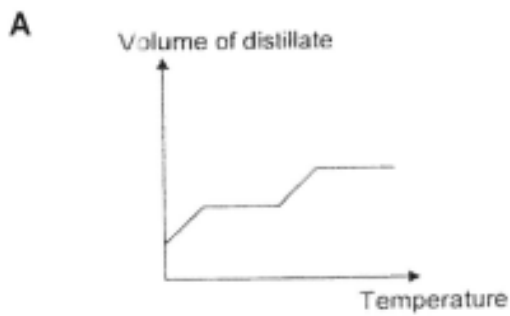
- A $\frac{S}{U}$
- B $\frac{T}{S}$
- C $\frac{S-T}{U}$
- D $\frac{S-T}{U-T}$

Q4

The diagram shows the apparatus used to separate Methylcyclopentane (boiling point 70°C) and heptane (boiling point 98°C).

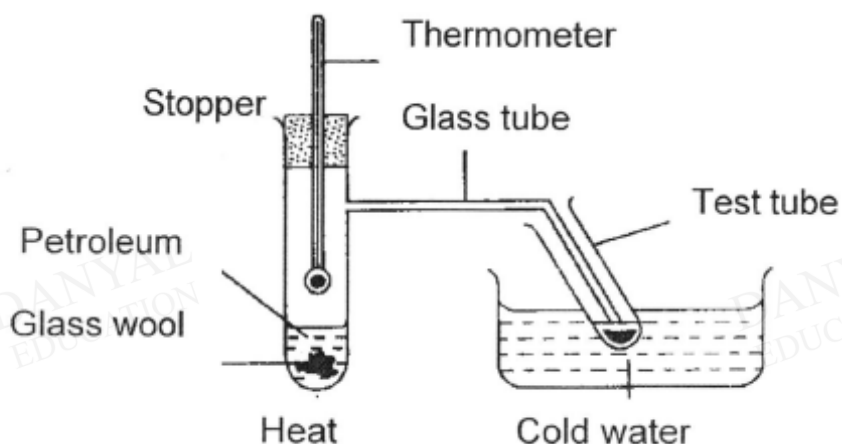


Which graph would be obtained if volume of distillate collected was plotted against temperature?



Q5

The diagram below shows the experimental set-up for fractional distillation of petroleum. However, there is an error in the set-up.

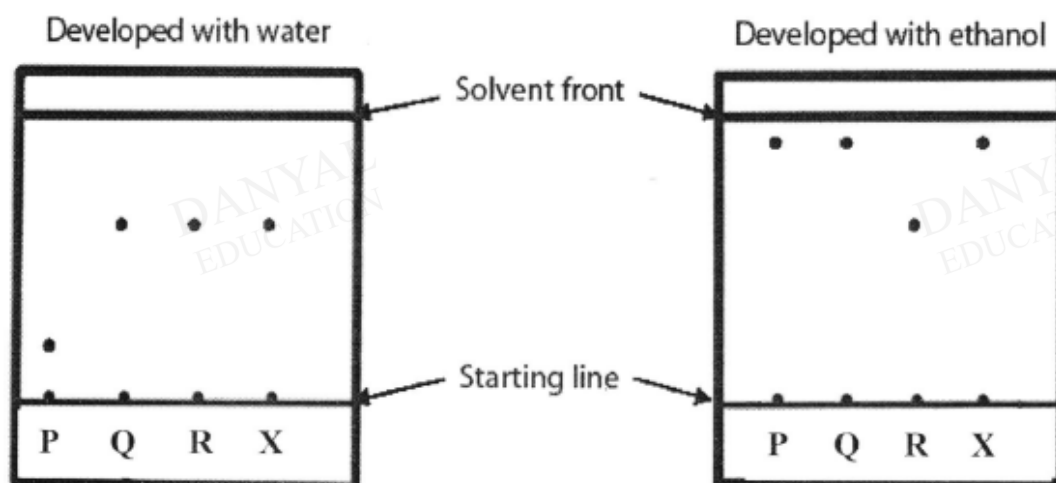


What is the error?

- A The thermometer should be placed at the junction of the glass tube.
- B The test-tube should be placed higher up from the cold water.
- C The glass wool should be placed above the petroleum.
- D The stopper should be removed to prevent pressure from building up.

Q6

Chromatography was used to identify four substances. The solvent used for one of the chromatography was water while the other was ethanol. Which substances are the same?



- A P and Q
- B Q and X
- C Q, R and X
- D P, Q and X

Q7

Camphor is a white solid isolated from camphor tree and has medicinal properties. It has a penetrating smell and has to be kept in closed containers in a cool place to prevent the crystals from "disappearing". It is sparingly soluble in water but readily dissolves in ether, an organic solvent.

Glauber's salt is isolated from mineral ore and consists of hydrated sodium sulfate. ($\text{Na}_2\text{SO}_4 \cdot 10 \text{H}_2\text{O}$).

A sample of camphor was found to be mixed with sand and Glauber's salt.

How may the components in the sample be separated and recovered?

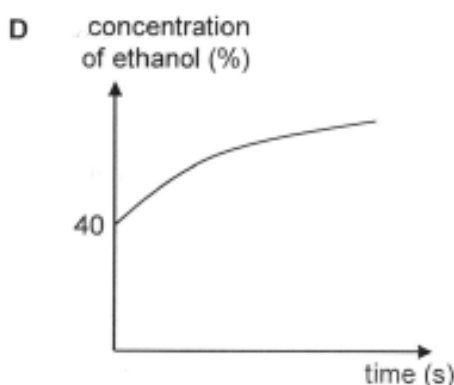
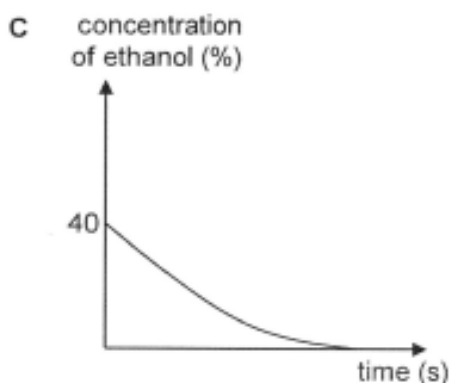
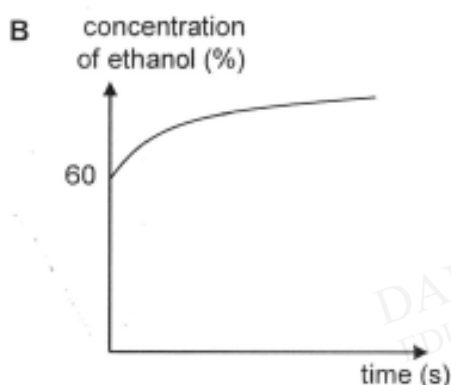
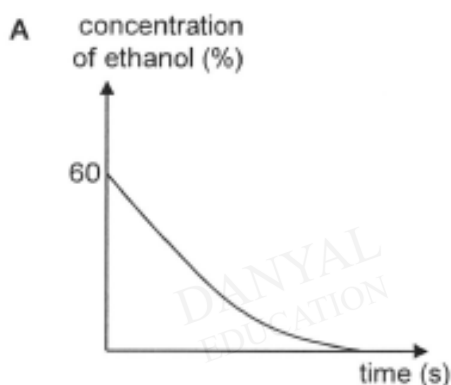
- A heating \rightarrow dissolving in water \rightarrow filtration \rightarrow crystallisation of filtrate
- B dissolving in ether \rightarrow filtration \rightarrow crystallisation of filtrate and heating of residue
- C dissolving in a mixture of ether and water \rightarrow using of separating funnel \rightarrow crystallisation
- D dissolving in ether \rightarrow filtration \rightarrow crystallisation of filtrate

Q8

Most alcoholic drinks are composed primarily of water and ethanol, with some traces of impurities and flavourings. Alcoholic drink X is made up of 40% by volume of ethanol.

A sample of alcoholic drink X is distilled using fractional distillation. Boiling points of ethanol and water are 78°C and 100°C respectively.

Which graph shows the change in concentration of ethanol in the round-bottomed flask as the distillation proceeds?



Q9

An organic solvent (hexane) and aqueous sodium chloride were accidentally mixed together.

Which methods of separation are needed to obtain pure samples of hexane and solid sodium chloride?

- A filtration followed by crystallisation
- B fractional distillation followed by evaporation to dryness
- C simple distillation followed by crystallisation
- D using a separating funnel followed by evaporation to dryness

Q10

Which is the best method of obtaining pure water from ink?

- A chromatography
- B distillation
- C filtration
- D freezing

Answers

Separation Techniques Test 1.0

Q1 C

Q2 A

Q3 D

Q4 C

Q5 A

Q6 B

Q7 A

Q8 C

Q9 B

Q10 B

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