Nalanda Vidyalaya – Colombo 10

Unit Test Project

| Grade 11 | Science | Unit : 03 - Mixtures |

MCQ Questions

(1) Compound A is purified by recrystallization. Accordingly which is the most probable graph that illustrates the vibration of solubility (s) of compound A versus temperation (T).

1)   2)   3)   4)

(2) Example for a solid – solid heterogeneous mixtures are,

A → brass   B → iron powder and $KMnO_4$

C → iron powder and sulphur   D → $KMnO_4$ and water

1) A and B   2) B and C   3) C and D   4) B and D

(3) If 25 ml is taken from 0.2 $moldm^{-3}$ NaOH solution and added water to it until the volume becomes 50 ml, the concentration of that solution is,

1) 0.1 $moldm^{-3}$ 2) 0.2 $moldm^{-3}$ 3) 0.3 $moldm^{-3}$ 4) 0.4 $moldm^{-3}$

(4) What is the substance that can be obtained by solvent extraction?

1) Obtaining salt from sea water.

2) Obtaining sugar from molasses.

3) Separate substance in plants which have medicinal properties.

4) All of the above.

(5) If salts such as $MgCl_2$ is deposited on salts obtained from salterns.

1) A bitter taste and a characteristic colour will occur.

2) Salt becomes moisture and a characteristic colour will occur.

3) Salt become bitter and moisture.

4) Salt become bitter and dry.

(6) The method of separating essential oil is,

1) Steam distillation   2) Solvent extraction

3) Fractional distillation   4) Crystallization

(7) The technique used to separate the components of chlorophyll is,

1) Crystallization   2) Solvent extraction

3) Distillation   4) Chromatography

(8) Which of the following is the type of salt precipitates in large shallow tanks of saltern.

1) Calcium carbonate   2) Sodium chloride

3) Calcium sulphate   4) Magnesium chloride

(9) Which is the method used in refining crude oil?

1) Fractional distillation   2) Steam distillation

3) Solvent extraction   4) Crystallization

(10) Koholle dissolves in kerosene oil. This is because,

1) Both koholle and kerosene oil are polar states.

2) Both koholle and kerosene oil are nonpolar states.

3) Koholle is polar and kerosene oil is nonpolar.

4) Koholle is nonpolar and kerosene oil is polar.

Structured Essay Questions

(1) A) i) A solution of 100 g is prepared by dissolving a mass of 30 g of solid $MgCl_2$ in pure water at 25 °C.

a) State the reason for selecting water to prepare $MgCl_2$ solution.

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b) Calculate the composition of the $MgCl_2$ solution prepared above as a mass function (m/m).

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ii) a) A small amount of $MgCl_2$ was deposited at the bottom of the beaker, when another 30g of $MgCl_2$ was added to the $MgCl_2$ solution prepared i) above stirred well and kept for a short time. What is the special name used to introduce this type of solution.

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b) The beaker with the solution in a) above was heated upto a temperature of about 60 °C. State an important observation that could be made here,

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c) Explain the reason relevant to the observation stated in b) above.

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B) Three instances relevant to separation of components from mixtures are given below.

  1) $\rightarrow$ Separation of various minerals from mineral sand.

  2) $\rightarrow$ Separation of petroleum by the mineral oil.

  3) $\rightarrow$ Obtaining components in chlorophyll pigment.

  i) Write the separation method used in the instances 1), 2) and 3) above, respectively.

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  ii) Calculate the mass of sodium hydroxide to prepare a $100 cm^3$ of 1.00 $moldm^{-3}$ sodium hydroxide solution. (Na – 23, O – 16, H – 1)

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Essay Questions

(1) Saline treatment is given to many patients treated in hospitals. A normal saline solution is prepared by dissolving 9g of sodium chloride in 1 dm^3 of distilled water.

  i) According to the "nature of the resulting saline solution" to what type of solution is it an example for?

  ii) What is the reason for your answer.

  iii) State the composition of a normal saline solution with respect ti its mass and volume (m/v).

  iv) When preparing standard solution in the laboratory the composition of the solution are expressed as concentration.

  a) Define the term "Concentration"

  b) What is the amount of NaCl moles in the above saline solution, if its concentration is 0.15 $moldm^{-3}$?

  c) State one main purpose of using each instrument stated below, when preparing standard solutions in the laboratory.

  i) Chemical balance

  ii) Volumetric flask

  iii) Glass funnel

  iv) Wash bottle

(2)   Given below are information as regards several mixtures prepared by a group of students.

Mixture	Method of preparation
A	Adding some wheat flour to a test tube about half filled with water and shaking thoroughly.
B	Adding 1 – 2 drops of kerosene oil to a test tube half filled with water and shaking thoroughly.
C	Taking 30 cm³ of liquid NaCl to a 100 cm³ volumetric flask. Adding water till the total volume was 100cm³.
D	Dissolving 50g of $CuSO_4$ in 150g of water completely.
E	Adding 15g of urea ($CO(NH_2)_2$) to a 500 cm³ volumetric flask adding water till the total volume was 500cm³.

i)   Of the above mixture, give 2 examples for heterogeneous mixture.

ii) What is the best method to express the composition of the mixture C, according to the data given in the table.

iii) What is the composition of the mixture D as a percentage by (m/m)

iv) What is the amount of urea [$CO(NH_2)_2$] used to prepare the solution E.
     (C = 12, H = 1, N = 14, O = 16)

v)   What is the concentration of the solution E.

vi) Name the instrument that should be used for the following.
     a) To measure 30 cm³ of liquid NaCl accurately.
     b) To transfer 15g of urea to the volumetric flask.