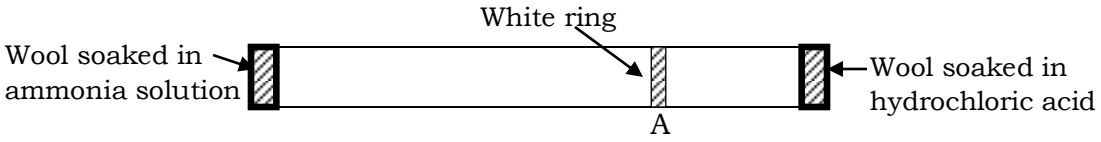
ORDINARY LEVEL CHEMISTRY PROBLEMS

PART 1: MATTER, ELEMENTS, COMPOUNDS AND MIXTURES

1 (a) Smoke was put in a glass-cell and viewed under a microscope.
(i). State what was observed
(ii). Explain the observation
(b) One piece of cotton wool was soaked in concentrated hydrochloric acid and the other in concentrated ammonia solution. The two pieces of cotton wool were placed in a glass tube as shown below.

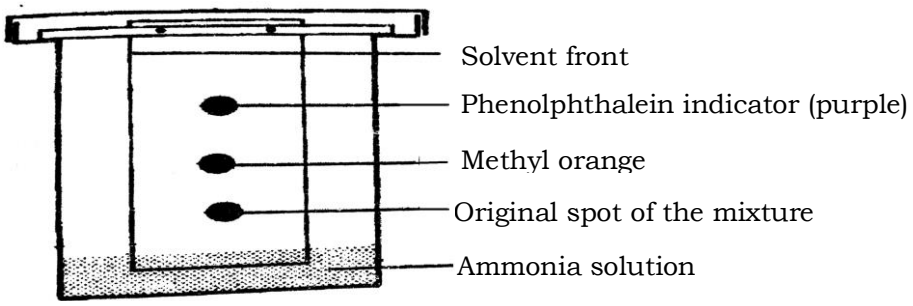


(i). Write the formula of the substance that formed the white ring
(ii). Explain why the white ring formed in position A, not in the middle of the tube

2 (a) Explain how a sample of sulphur can be obtained from a mixture of iron and sulphur
(b) A mixture of sulphur and iron was heated.
(i). State what was observed
(ii). Write equation for the reaction that takes place

3 (a) State two properties of air as a mixture
(b) Name the two main components of air
(c) State the method by which the components of air are separated. Give a reason for your answers

4 (a) A mixture of phenolphthalein and methyl orange was separated as shown in the diagram below.



Name the method of separation
(b) (i). State the colour of methyl orange in this experiment
(ii). Phenolphthalein is usually colourless. Explain why it is purple in this experiment
(c) Give any other two mixtures that can be separated using this method

5 (a) Name one method by which the components of the following mixtures can be separated
(a) Pigments of green leaf
(b) Water and ethanol
(c) Iodine and potassium iodide

(d) Copper(II) sulphate and copper(II) carbonate

6 (a) During an experiment, a beam of light was passed through a dark room and dust particles were seen moveing in all directions. State

(i). Why the dust particles moved in all directions

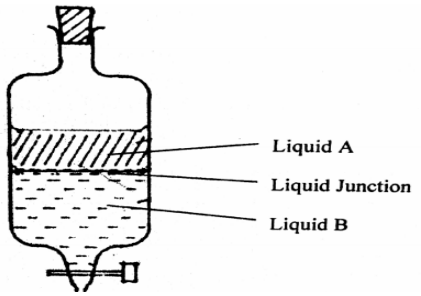
(ii). What the experiment indicated

(b) Temperature of the room was increased.

(i). State what was observed

(ii). Give a reason for your answer

7 (a) Figure below shows the setup of the apparatus that can be used to separate a mixture of water and kerosene.



Identify the liquids A and B

(b) State why

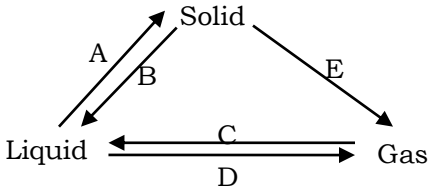
(i). Liquid A forms the upper layer

(ii). The two liquids form a liquid junction

8 (a) Name the method by which a mixture of sodium carbonate and sodium hydrogen carbonate can be separated. Give a reason for your answer

(b) Briefly describe how a dry sample of sodium hydrogen carbonate can be obtained from the solution containing both salts

9 (a) The diagram below shows how states of matter can change under different conditions.



Name the change of states of matter represented by each of the letters A to E

(b) Name two substances that can undergo the change of state represented by E

(c) State two conditions that can bring about the change in D.

10 (a) State what would be observed if a mixture of iron filings and sulphur is warmed with

(i). Carbon disulphide

(ii). Dilute sulphuric acid

(b) A mixture of iron filings and sulphur was heated strongly

(i). Name the substance that was formed

(ii). Write equation for the reaction that took place

11 (a) Duralumin is an alloy containing copper and other metals
   (i). Name two other metals present in duralumin
   (ii). Arrange the metals present in duralumin in their order of reactivity, starting with the most reactive
   (iii). State one use of duralumin
(b) Name
   (i). One other alloy that contains copper
   (ii). Other metals present in the alloy you have named

12 (a) State how the following mixtures can be separated
(a) Carbon and iron
(b) Ink
(c) Oxygen and nitrogen
(d) Iodine and sodium sulphate
(e) Sodium chloride and sodium carbonate

13 (a) Tea was placed in a cup of hot water and allowed to stand. State
(b) Name the process that occurred
(c) State what the process you have named demonstrated

14 (a) A small amount ethanol was added to a large amount of water and the mixture shaken. State what was observed
(b) In the mixture in (a), state which one of the components is the
   (i). Solute
   (ii). Solvent
(c) Name the method that you would used to separate the mixture formed
(d) In another experiment; simsim oil was shaken with water.
   (i). State what observed
   (ii). Give a reason for your answer
   (iii). Name the piece of apparatus that can be used to separate the mixture

15 (a) Duralumin is an alloy of aluminium, copper and element D
   (i). Identify element D
   (ii). State one use of duralumin
(b) Name the elements commonly used to make each of the following alloys and in each case, give one use of the alloy.
   (i). Solder
   (ii). steel
(c) State two reasons why alloys are commonly used instead of pure metals

16 (a) State one method by which each of the following mixtures can be separated
   (i). Iron(II) chloride and iron(II) oxide
   (ii). Ammonium chloride and potassium chloride
   (iii). Sodium carbonate and sodium hydrogencarbonate
   (iv). Components of ink
(b) Give a reason why it is possible to separate the mixtures using the method you have named

17 (a) Sea water contains mainly dissolved sodium chloride and traces of potassium bromide. State one practical method that can be used to obtain the following from sea water
   (i). Chlorine
   (ii). Sodium chloride
   (iii). Water free from ions
(b) State two reasons why water is considered as a compound and not a mixture

18 (a) What is an alloy
(b) Complete the table below by filling in the composition of the following alloys and two uses of each alloy in each case.

Alloy	**Composition**	**Uses**
Brass		
Bronze		
Solder		
Steel		

(c) State two reasons why alloying is important.

19 (a) What do you understand by the terms
   (i). Sublimation
   (ii). Evaporation
(b) State two substances that undergo sublimation
(c) State two practical applications of
   (i). Sublimation
   (ii). Evaporation

20 (a) State the type of change that takes place when the following substances are
   (i). Heated
      - Sodium chloride
      - Ammonium chloride
      - Lead(II) carbonate
   (ii). Dissolved in water
      - Sodium hydroxide
      - Sodium oxide
      - Carbon dioxide
(b) Copper(II) sulphate crystals were placed at the bottom of the plastic beaker which was half-filled with water and the setup left to stand for some time
   (i). State what was observed
   (ii). Name the process taking place
(c) A mixture of sodium sulphate and lead(II) sulphate was added to water, shaken well and filtered
   (i). State which one of the substances appeared in the
      - Filtrate
      - Residue
   (ii). Give a reason for your answer in b (i)