Name………………………………………………………………………

Summer Support Work Chemistry - Year 7

Following on from your End of Year examination, these questions are designed to help reinforce the material you should have covered this year.

Follow the below procedure and tick off as each task is completed.

1   Use your End of Year paper to improve your revision notes and further study the topics you should have prepared.   ☐

2   When more confident attempt the questions in this booklet in **black ink** without referring to your notes (you could do this in several sittings).   ☐

3   Return to this booklet and use your notes to help finish and improve your answers in **blue pen**.   ☐

4   In September, use a Mark Scheme during drop-in support sessions to work through the correct answers making corrections in red/green pen. Get help if not sure.   ☐

5   See Mr Young to show that you have completed all of the above by **mid September**.   ☐

Q1.

A student wants to find out if the green colouring in grass is a mixture of dyes.

He uses a solvent to dissolve the green colouring from some grass.

He then separates the solution of the green colouring from the remaining grass.
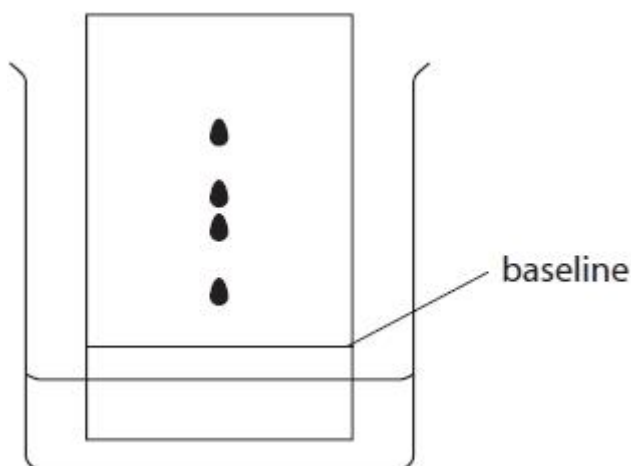
(a) Which of these methods is used to separate the solution of the green colouring from the remaining grass?

(1)

☒ **A** boiling
☒ **B** condensation
☒ **C** evaporation
☒ **D** filtration

(b) The student uses a dropping pipette to place a drop of the green solution onto a piece of chromatography paper and produces a chromatogram.

The diagram shows his results.

(i) Add three more labels to the diagram to show

- the solvent
- the chromatography paper
- the original position of the spot of the green solution

(3)

(ii) Explain how many different dyes are present in the green colouring.

(1)

....

....

....
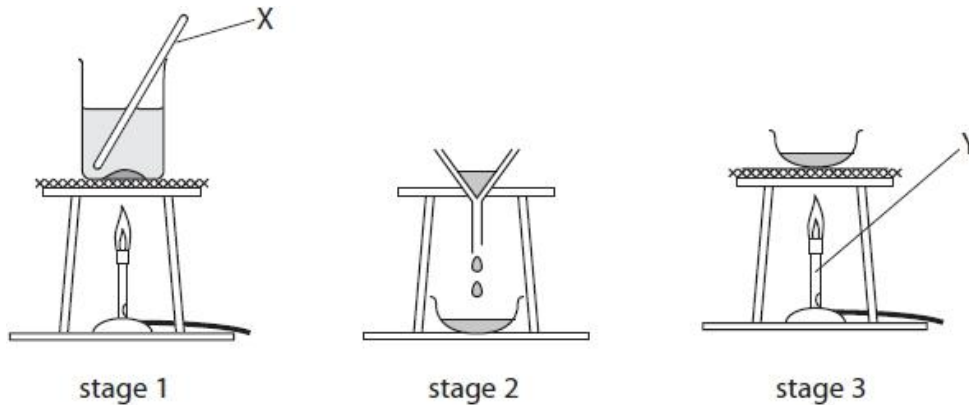
(Total for question = 5 marks)

Q2.

The diagram shows the apparatus a student uses to separate a mixture of salt and sand.

She adds the mixture to water in a beaker and then carries out the three stages shown.

stage 1   stage 2   stage 3

(a) Give the names of the pieces of apparatus labelled X and Y.

(2)

X ....

Y ....

(b) (i) A liquid that dissolves substances is a

(1)

☒ **A** solute
☒ **B** solution
☒ **C** solvent
☒ **D** suspension

(ii) The clear liquid that forms in stage 1 is a

(1)

☒ **A** solute
☒ **B** solution
☒ **C** solvent
☒ **D** suspension

(c) (i) At which stage, 1, 2 or 3, is the sand collected?

(1)

....

(ii) At which stage, 1, 2 or 3, is the salt collected?

(1)

....

(d) What happens to the water in stage 3?

(1)

....

(Total for question = 7 marks)

Q3.

A student was asked to find the mass of salt dissolved in 100 cm^3 of sea water.
She was given the following instructions.

Step **A**   Weigh an empty evaporating basin
Step **B**   Transfer 50 cm^3 of sea water into the basin
Step **C**   Heat the sea water in the basin until all the water has evaporated
Step **D**   Allow the basin and residue to cool
Step **E**   Weigh the basin and residue of salt

(a) During the experiment, the student used several pieces of apparatus.
Some of them are shown in the table.

Complete the table.

(6)

Image of apparatus	Name of apparatus	One step in which the apparatus was used
	evaporating basin	C
	tripod	

(b) State, with a reason, **one** safety precaution that the student should take when doing this experiment.

(2)

Precaution

....

Reason

....
....
....

(c) The student obtained the following results.

mass of basin and salt (step **E**)   =   81.50 g

mass of empty basin (step **A**)   =   78.60 g

Calculate the mass of salt dissolved **in 100 cm³** of sea water.
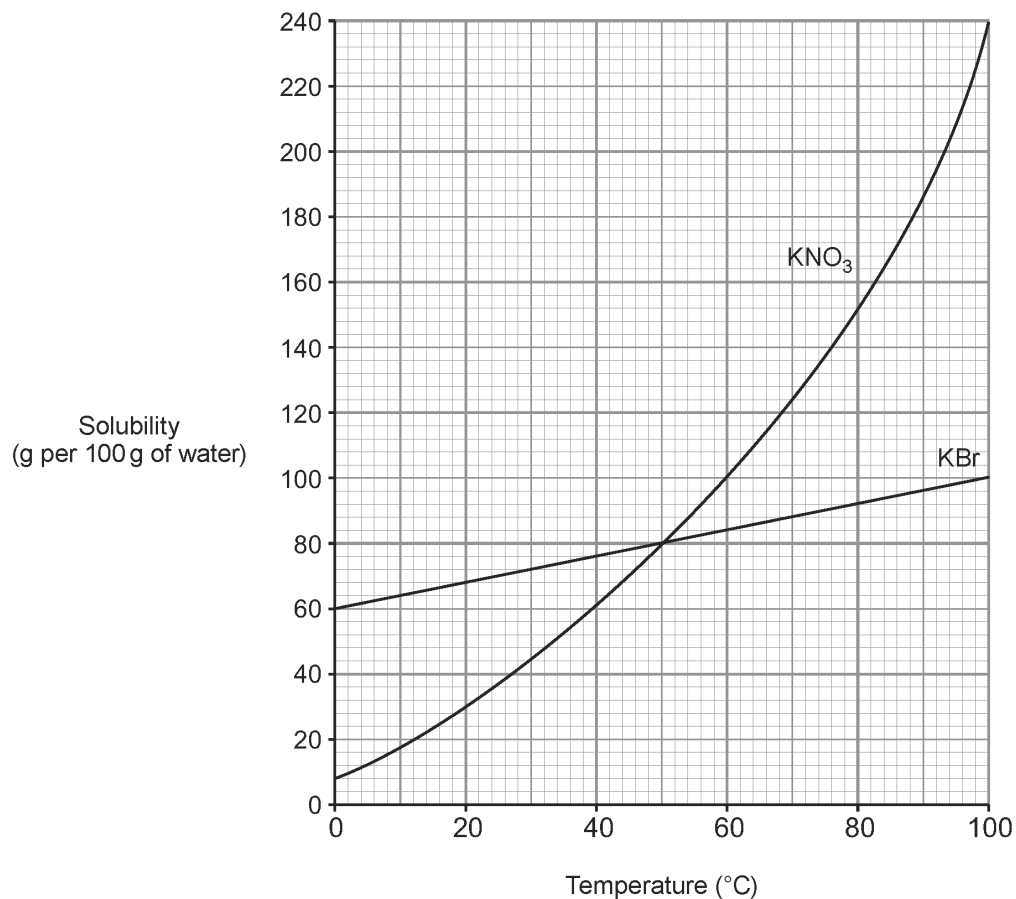
(1)

Mass of salt = ... g

(Total for Question = 9 marks)

1. The following graph shows the solubility curves of two substances.

(a) (i)   Use the graph to find the solubility of potassium bromide, KBr, at 60 °C.   [1]

Solubility = ... g per 100 g of water

(ii) A student places 200 g of potassium bromide in 200 g of water at 60 °C and stirs until no more dissolves. Calculate the mass of solid that remains undissolved.   [2]

Mass of undissolved solid = ... g

(b) Compare the solubilities of potassium bromide and potassium nitrate between 0 °C and 100 °C. [3]

....

....

....
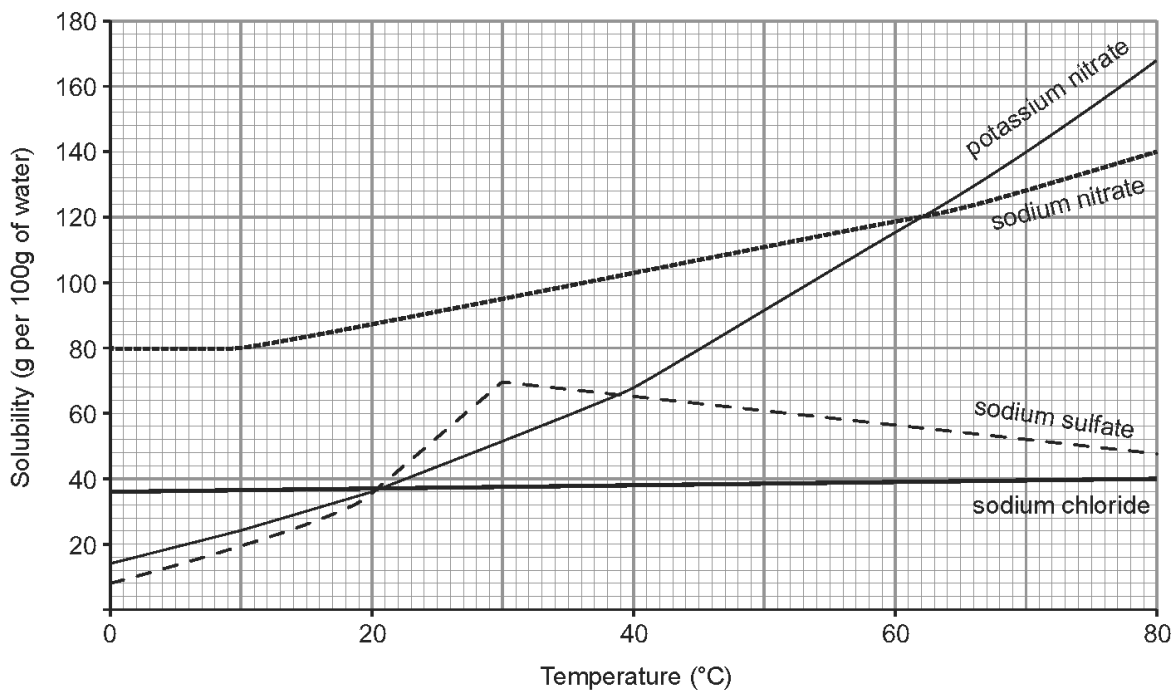
6

2. The following graph shows how the solubility of four different substances varies with temperature.

(a) Name the substance that shows the smallest change in solubility. [1]

....

(b) Give the temperature at which the solubility of potassium nitrate and sodium nitrate is the same.

.... °C [1]

(c) If a saturated solution of sodium nitrate in 100 g of water is cooled from 80 °C to 10 °C, calculate the mass of crystals that will be formed. [2]

Mass of crystals formed = ... g

(d) Describe, **using data from the graph**, how the solubility of sodium sulfate changes with temperature. [2]

....

....

....

6

3.

(a) The box below contains the names of seven different substances.

aluminium	iodine	nitrogen dioxide	crude oil
sodium	sulfur	water	

Use **only** the substances given above to answer parts (i)-(iii).

Each substance can be used once, more than once or not at all.
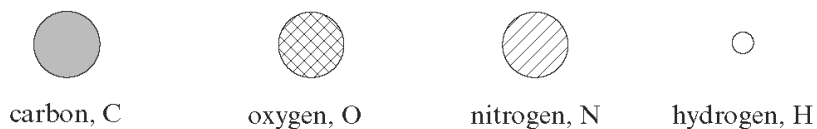
(i) Name **two** metals. [1]

.... and ....

(ii) Name **two** compounds. [1]

.... and ....

(iii) Name **one** mixture. [1]

....

(b) The key below represents atoms of some elements.

carbon, C   oxygen, O   nitrogen, N   hydrogen, H

(i) Ammonia has the formula NH_3.

Choose the letter of the diagram below that represents a molecule of ammonia. [1]

A   B   C   D

Letter

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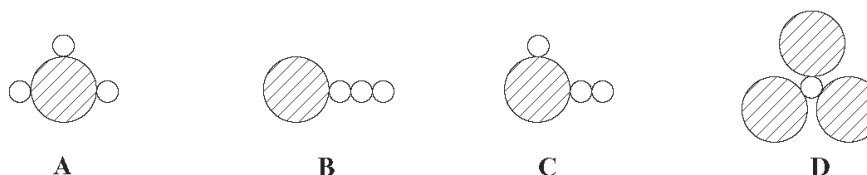
(ii) Use the **key** to draw a diagram representing a molecule of

    I   oxygen, O_2,   [1]

    II   carbon dioxide, CO_2.   [1]

(iii) The chemical formula of sodium carbonate is Na_2CO_3.

    I   State how many carbon atoms are present in the formula Na_2CO_3.   [1]

    ....

    II   Give the **total** number of atoms shown in the formula.   [1]

    ....

8

4.

(a) The key below represents atoms of some elements.
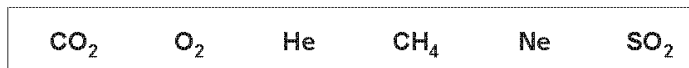
nitrogen, N　　　hydrogen, H　　　oxygen, O

(i) Use the key to draw a diagram representing a molecule of nitrous oxide, N_2O. [1]

(ii) Use the key to give the chemical formula for the following molecule. [1]
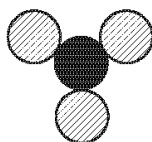
Formula ....

(b) The box below shows the symbols and formulae for some gases.

CO_2	O_2	He	CH_4	Ne	SO_2

Choose from the box

(i) **two elements,** .... and .... [1]

(ii) **two compounds.** .... and .... [1]

(c) The chemical formula of nitric acid is HNO_3.

(i) State how many nitrogen atoms are present in the formula, HNO_3. .... [1]

(ii) Give the **total** number of atoms shown in the formula. .... [1]

(d) You may wish to refer to the table of common ions to help you answer parts (i) and (ii).

(i) Give the **formulae** of the **ions** present in the compound $MgCl_2$. [1]

Positive ion .... 　　　*Negative ion* ....

(ii) Give the chemical formula for sodium hydroxide. [1]

....

8

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