**NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM/NO\_\_\_\_\_\_\_\_\_\_\_**

**DATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ FORM\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CHEMISTRY**

**TERM ONE 2017**

**FORM F2**

**TIME:**

**HOLA SECONDARY SCHOOL**

**MID TERM EXAMINATION**

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**INSTRUCTIONS: Answer all questions.**

**1a)** Name the method that can be used to obtain pure iron (III) chloride from a mixture of iron III chloride and Sodium chloride. (1mks)

b) A student was provided with a mixture of sunflower, common salt and a red dye. The characteristics of the three substances in the mixture are given in the table below.

|  |  |  |
| --- | --- | --- |
| **Substance** | **Solubility in water** | **Solubility in Ethanol** |
| Sunflower  Common salt  Solid red dye | Insoluble  Soluble  Soluble | Insoluble  Insoluble  Soluble |

The student was provided with ethanol and any other material needed. Describe how the student can separate the mixture into its three components. (5mks)

2. Classify the substances water, iodine, candle wax, rust iron, charcoal and sulphur into element and compounds. (6mks)

|  |  |
| --- | --- |
| **Elements** | **Compounds** |
|  |  |

3. Naturally occurring Magnesium consists of three isotopes 78.6%24 Mg, 10% 25Mg and 26Mg. Calculate to one decimal place, the relative atomic mass of Magnesium. (3mks)

4. The figure shows the changes that take place between states of matter. Some of them have been indentified and others labeled.

a) Give the names of the processes

i) J (1mk)

ii) G (1mk)

iii) H (1mk)

b) Name two substances that can undergo process H. (1mk)

5a) Other than their location in the atom, name two other differences between an electron and a proton. (2mks)

b) The table below gives the number of electrons, protons and neutrons in particles A, B, C, D, E, F and G.

|  |  |  |  |
| --- | --- | --- | --- |
| **Particle** | **Protons** | **Electrons** | **Neutrons** |
| A  B  C  D  E  F  G | 6  10  12  6  13  17  8 | 6  10  10  6  10  17  10 | 6  12  12  8  14  18  8 |

i) What is the mass number of E? (1mk)

ii) Identify isotopes in the particles (2mks)

iii) Which particles are ions? (3mks)

iv) Identify particles that are metals. (2mks)

v) Draw the structure of the atom of particle C showing how electrons are arranged. (2mks)

vi) Name the elements that belong to period 3. (3mks)

vi) To which group does particle B belong? Explain. (2mks)

c. Study the table below and complete it. (W- and X4+ are not the actual symbols of the ions). (4mks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ION** | **No. of protons** | **No. of Neutrons** | **Mass Number** | **Electron arrangement** |
| W- |  | 20 |  | 2.8.8 |
| X+4 | 14 |  | 28 |  |

6. Fractional distillation of liquid air usually produces nitrogen and oxygen as the major products.

a) Name two substances that can be used to remove carbon dioxide from the air before it is changed into liquid. (2mks)

b) Describe how Nitrogen gas is obtained from the liquid air (BP N = -196oc O = -183oc) 3mks)

7. State two similarities between a Neutron and a proton. (2mks)

8. Explain why an atom is electrically neutral and yet they have different sub-atomic particles together. (2mks)

9. An element has electronic configuration 2, 8, 18, 6. What is the atomic number of the element? (1mk)

10. State one advantage that solid carbon dioxide (dry ice) would have over ordinary ice when used to cool some foods stuffs. (1mk)

11. The boiling point of water is 100oc and its melting point is Ooc. Sketch a cooling curve that would be obtained when a boiling tube containing water at 90oc is immersed in a freezing mixture maintained at -10oc. (3mks)

12. State two methods of preventing rusting. (2mks)

13. Where do you think oxygen gas can be applied identify 3 areas. (3mks)

14. Explain why most laboratory apparatus are made of glass. (2mks)

15. Identify three areas where the knowledge of chemistry can create a career opportunity.(3mks)

16. Name two gases other than oxygen and nitrogen, which are present in the atmosphere. (2mks)

17. Outline three differences between a compound and a mixture. (3mks)