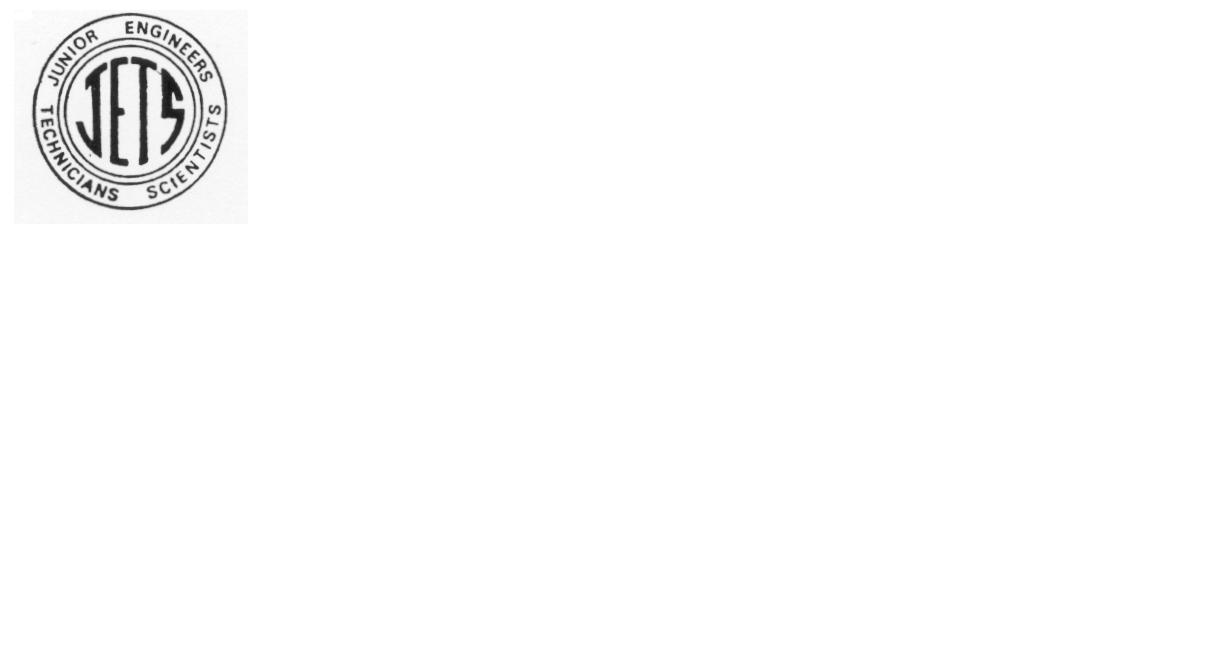
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JETS OF ZAMBIA

MUCHINGA PROVINCE

**2015 DISTRICT JETS FAIR**

**JUNIOR CHEMISTRY OLYMPIADS**

**TOTAL MARKS 50**

INSTRUCTIONS

* ANSWER ALL QUESTIONS IN THIS PAPER.
* USE OF CALCULATORS IN THIS PAPER IS ALLOWED.
* SHOW YOUR WORKING.

Q1. (a) Outline four characteristics of a solid [4]

(b) When a metal such as copper is heated it expands. Explain what happens to the metal particles as it expands. [2]

(c) Name the three fundamental particles of an atom. [3]

(d) What is the other name for electron shells of an atom? [1]

(e) State three differences between boiling and evaporation. [3]

(f) What do we call a concentrated sodium chloride solution? [1]

Q2. Some reactions of metals W, X, Y and Z are given below.

|  |  |  |
| --- | --- | --- |
| METAL | REACTION WITH WATER | REACTION WITHDILUTE HYDROCHLORIC ACID |
| W | A few bubbles from slowly in cold water. | Vigorous reaction. Gas given off |
| X | Vigorous reactions. Metals melts. Gas given off. | Explosive reaction should not be attempted. |
| Y | No reaction | No reaction |
| Z | Does not react with cold water. Hot metal reacts with steam | Steady fizzing |

(a) Arrange these metals in order of reacting.

i) Most reactive? [1]

ii) Least reactive. [1]

(b) Which of these metals could be

(i) Magnesium [1]

(ii) Copper [1]

(c) The equation for the reaction of X with cold water is given below.

2X(s) +2H2O→2XOH(aq)+H2(g)

(i) Describe the test you would use to show that the gas evolved is hydrogen [2]

(ii) How could you show that the water contained a compound of the type XOH [2]

(iii) In which group of the periodic table does metal X belong? [2]

(iv) The ore of X is its Chloride. Suggest how metal X could be extracted from its Chloride? [2]

Q3. Copper is purified by electrolysis.

1. Complete the following:
2. The positive electrode(anode) is made from [2]
3. The negative electrode(cathode) is made from [2]
4. The electrolyte is aqueous [1]
5. Give two reasons why copper is used,
6. in electric wiring [1]
7. in cooking utensils [1]
8. give another use of copper [1]
9. Choose a gas from the following list to answer the questions below. Each gas may be used once, more than or not at all. Ammonia, argon, carbon dioxide, chlorine, ethane, hydrogen, nitrogen and oxygen.
10. is a noble gas [1]
11. is an acidic oxide [1]
12. can be polymerized [1]
13. is an active component of air [1]
14. is used in the treatment of water [1]
15. is a product of respiration [1]

Q4. Water can react with both sodium and magnesium.

(a) State the form of water that does react with

(i) Sodium [1]

(ii) Magnesium [1]

(b) Name the products of water reacting with

(i) Sodium [1]

(ii) Magnesium [1]

(c) Water is mainly obtained from rivers, bore holes and wells and this water must be treated before use.

(i) State one reason for water treatment. [1]

(ii) Name any one method used for water treatment. [1]

(iii) Name a chemical added to water during water treatment. [1]

(d) Mineral water is preferred to distilled water for drinking.

(i) Give one advantage of mineral water. [1]

(ii) Name any two substances found in mineral water. [2]

THE END!!!!