CHEMISTRY DEPARTMENT

S.6 BRAINSTORMING TEST

TOPIC; TRANSITION ELEMENTS

SUB-TOPIC; CHEMISTRY OF IRON

NAME_____

Signature _____ **STREAM**_____

Instructions; Attempt **all** questions in this paper.

1. (a) Write

(i) The electronic configuration of iron atom (atomic number =26) (01 mark)

_____

(ii) The all the possible oxidation states of iron. (01 mark)

_____

b) (i) State the most common oxidation state of iron.

_____

c) (i)Write the formulae of the oxide of iron in each of the above oxidation states. (1 mark)

_____

(ii) State three reasons why iron is a transition element. (03marks)

_____

_____

_____

2. (a) Write an equation(s) for the reaction of iron with

(i) Air ($1\frac{1}{2}$ marks)

_____

(ii) Water ($1\frac{1}{2}$ marks)

_____

(iii) dilute acids (03 marks)

(iv) Concentrated acids. (03 marks)

(v) hot concentrated sodium hydroxide solution

3. (a) State the conditions for reaction and write an equation for the reaction in each case when iron is reacted with each of the following

(i) chlorine gas

Observation

Equation

(ii) hydrogen chloride gas

Observation

Equation

(iii) sulphur

Observation

Equation

(b) A solution of iron(III) sulphate turns a blue litmus paper to red. Explain this observation (03 marks)

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_____

_____

3. (a) State what is observed and write an equation for the reaction when concentrated sodium hydroxide solution is heated with iron(III) oxide

Observation

_____

Equation

_____

b) State what is observed and write an equation for the reaction when iron(III) sulphate solution is added each of the following

(i) potassium hexacyanoferrate(II) solution

Observation (01 mark)

_____

Equation (1½ marks)

_____

(ii) Sodium hydroxide solution drop-wise until in excess

Observation (01 mark)

_____

Equation (01 mark)

_____

_____

(iii) Potassium thiocyanate solution.

Observation

_____

Equation (1½ marks)

_____

c) State what is observed and write an equation for the reaction when iron(II) chloride solution is added each of the following

(i) potassium hexacyanoferrate(III) solution

Observation (01 mark)

_____

Equation (1½ marks)

_____

(ii) Sodium hydroxide solution drop-wise until in excess

Observation (01 mark)

_____

Equation (01 mark)

_____

4. State what is observed and write an equation for the reaction in each case when iron(III) chloride solution was added to aqueous solutions of each of the following solutions.

(i) Sodium carbonate

Observation (01 mark)

_____

Equation (1½ marks)

_____

(ii) Potassium hydrogencarbonate

Observation (01 mark)

_____

Equation (1½ marks)

_____

(iii) Sodium sulphide

Observation (01 mark)

_____

Equation (1½ marks)

_____

5. (a) Iron can be extracted from spathic ore. Write formula of the ore.

_____

(b) Describe how iron can be extracted from the above ore.

_____

_____

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_____

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_____

(iii) State one alloy of iron.

_____

_____

END.