Exercise.1a

Multiple choice questions.

1. Which of the following metal ions is not a transitional metal cation.

a. Mn^{2+} b. Cu^{+} c. Ti^{2+} d. V^{3+}

2. Identify the element that forms the highest oxidation state.

a. Fe b. Mn c. Co d. Ni

3. Identify the ion that forms a compound with the lowest oxidizing power.

a. VO_3^{-} b. $Cr_2O_7^{2-}$ c. MnO_4^{2-} d. MnO_4^{-}

4. Which of the following ions are blue in solution.

a. Ni^{2+} b. Fe^{2+} c. Cr^{3+} d. Cu^{2+}

5.Formation of colour in transition metals is as a result of

a. having many oxidation states

b. Ligand exchange.

c. Having a partially filled d-orbital that allows absorbs and then emits radiations in the visible region of the spectrum.

d. change in coordination number.

6. Which of the following is a bidentate ligand?

a. NH_3 b. Cl c. SO_4^{2-} d. $C_2O_4^{2-}$

7. One good example of ligand exchange is a solution of copper ii ions is treated concentrated hydrochloric acid and then followed by concentrated ammonia.

what color changes take place.

a. blue to yellow to dark blue b. pale blue to green to dark blue

c. blue to yellow to green d. green to yellow to blue.

8. Which of these properties is not very specific for transitional metals?

a. Variable oxidation states. b. Coloured compounds.

c. Formation of complexes. d. Formation of alloys.

9. Which of these ions will have the least paramagnetism character.

a. Fe b. Zn c. Co d.Mn

Multiple choice questions.

1. Name the process of extraction of chromium

a. Kroll process b. Thermit process c. Contact process d. Ostwald's process

2. Which ore is used in extraction of Cr.

a.Heamatite b. bauxite ore c. magnetite d. Chromite

3. What is the most stable oxidation state of chromium.

a. +2 b. +3 c. +4 d. +6

4. Identify the colour of the solution when potassium chromate is mixed with sulphuric acid.

a. yellow b. green c. blue d. orange

5. 0.15g of a sample of iron wire was dissolved indilute sulphuric acid and this solution required $20cm^3$ with 0.02M potassium dichromate during titration.

Calculate the percentage purity of iron in the wire.

a. 89.6% b.74.7% c. 50% d.81.1%

6. $25cm^3$ of portion of iron (II) chloride solution required, after acidification, $15cm^3$ of 0.01M solution of potassium dichromate (VI). Calculate the concentration of the solution.

a. 0.01M b. 0.036M c. 0.024M d. 0.03M

7. 3.34g of a sulphate, $FeSO_4\,nH_2O$ were dissolved in $250cm^3$ of aqueous solution. $25cm^3$ of the above solution of required $20cm^3$ of 0.01M acidified potassium dichromate (VI)in titration.

a.7 b. 8 c.14 d.15

8. State what is observed when sodium hydroxide reacts with Cr^{3+} solution.

a. White precipitate. b. green precipitate. c. brown precipitate d. yellow precipitate.

9. State what is observed when potassium chromate reacts with silver nitrate.

a. White precipitate. b. green precipitate. c. red precipitate d. yellow precipitate

10. Which of the following ions will form a carbonate.

a. Fe^{3+} b. Cr^{3+} c. Al^{3+} d. Fe^{2+}

Exercise.1f.

Multiple choice questions.

1. Identify the chief ore of Mn.

a. Bauxite ore b. Sedirite c. pyrolusite d. Heamatite

2. Which of the following elements is used in the reduction during the manufacture Mn.

a. Al b. C c. Mg d. Ca

3. Which of the following acids is best used to acidify potassium permanganate.

a. HCl b. HNO_3 c. H_2SO_4 d. HBr

4. A sample of steel, 0.1646g was dissolved in dilute sulphuric acid and this solution required $27.4cm^3$ with 0.02M potassium permanganate during titration.(Fe 56)

Calculate the percentage purity of iron in the wire.

a. 2% b.93.2% c. 50% d.1.7%

5. A sulphate 2.95g of $FeSO_4\,xH_2O$ were dissolved in $250cm^3$ of aqueous solution. $25cm^3$ of the above soluition of required $21.2cm^3$ of 0.01M acidified potassium manganate (VII)in titration. (Fe 56)

a.7 b. 8 c.14 d.15

6.An iron tablet containing iron (ii) sulphate was analysed using 0.005M $KMnO_4$. The tablet mass o.65g was dissolved in $100cm^3$ of dilute suphuric aicd. 10 $cm^3$of the solution required $6cm^3$ of $KMnO_4$ to produce a faint pink solution. What is the percentage of theIron in the tablet?(Fe 56)

a. 12.9% b. 15.5% c. 14% d. 20%

7. In the determination of Fe^{2+} and Fe^{3+}salts in the mixture containing both. $25cm^3$ of the solution required $15cm^3$ of 0.02M acidified potassium permanganate for complete reaction.

After reduction of Fe^{3+} to Fe^{2+} using zinc powder , $25cm^3$ of solution required $30cm^3$ of 0.02M acidified potassium permanganate for complete reaction .

Determine the mole ratios of Fe^{3+}: Fe^{2+}.

a. 1:1 b. 1:2 c. 2:1 d. 3:1

8. State what is observed when sodium hydroxide reacts with Mn^{2+} solution.

a. dirty white precipitate. b. green precipitate. c. brown precipitate. d. yellow precipitate.

9. Mangenese (ii) chloride is dissolved in water. To a solution of Mn^{2+} ions add a little conc. nitric acid followed by

Sodium bismuthate and heat. State the color of the solution which is observed after heating.
a. Pink solution. b. Purple solution. c. yellow solution. d. Green solution.

Exercise.1.g.

Multiple choice questions.

1. Identify the chief ore of Iron.
a. Iron Pyrite b. Haematite. c. Magnetite d. Siderite.
2. State what is observed when sodium hydroxide reacts with Fe^{2+} solution.
a. dirty white precipitate. b. dirty green precipitate. c. brown precipitate d. yellow precipitate.
3. State what is observed when sodium hydroxide reacts with Fe^{3+} solution.
a. dirty white precipitate. b. dirty green precipitate. c. brown precipitate d. yellow precipitate .
4. Which of these metals is best in protection of iron against rusting
a. Sn b. Ag c. Cu d. Zn
5. All these elements are important components in stainless steel except
a. Cr b. Fe c. C d. Cu

Exercise.1.j.

Multiple choice questions.

1. State what is observed when sodium hydroxide reacts with Cu^{2+} solution.
a. blue precipitate. b. green precipitate. c. brown precipitate d. yellow precipitate .
2. Identify the chief ore of copper.
a. Cu_2S b. $CuFeS_2$ c. Cu_2S d. $Cu(OH)_2$
3. What is observed when copper carbonate is heated strongly?
a. yellow residue b. brown residue c. black residue d. green residue.
4. What is observed when Cu^{2+} ions react ammonia dropwise till excess.
a. a blue precipitate insoluble excess. b. a green precipitate insoluble in excess.
c. a blue precipitate soluble in excess. d. a white precipitate insoluble in excess.
5. Copper reacts with concentrated nitric acid to give a
a. a blue solution and brown gas. b. a green solution and colourless gas.
c. a colorless solution and a brown a gas. d. yellow solution and brown gas.
6. Brass is an alloy of copper and zinc. It reacts with nitric acid to give a solution containing Cu^{2+} ions. The solution was added to excess $KI_{(aq)}$ and titrating the iodine formed against standard thiosulphate solution.
Zinc does not react.
$2Cu^{2+}_{(aq)} + 4I^-_{(aq)} \rightarrow 2Cu_{(s)} + I_{2(aq)}$
$I_{2(aq)} + 2S_2O_3^{2-}{}_{(aq)} \rightarrow 2I^-_{(aq)} + S_4O_6^{2-}{}_{(aq)}$
In analysis, 0.2685g used $27.5cm^3$ of 0.1M sodium thiosulphate. Calculate the mass of copper in the specimen of brass.
a. 45% b. 65% c. 35% d. 25%.

Trial questions 2

Multiple choice questions.

1. Choose the suitable answer. In sodium extraction, fused (molten) NaCl is used rather than the dissolved (aqueous) NaCl because:
a. Obtaining molten NaCl is easy than obtaining aqueous NaCl.
b. In molten NaCl, the ions are free to move and not in aqueous NaCl.
c. Molten sodium NaCl is an electrolyte and not the aqueous NaCl.
d. Electrolysis of molten NaCl gives Na metal at the cathode but that of aqueous NaCl gives H_2 gas.
2. During extraction of Zn. Zinc is purified by electrolysis, Which of the following is the best electrolyte for the process.
a. $ZnCO_3$ b. $Zn(OH)_2$ c. $ZnSO_4$ d. ZnO
3. Which of the following elements can not be obtained by reduction using carbon.
a. W b. Ta c. Cu d. Zn
4.Which metal is extracted from Bauxite.
a. Tin b. Tantalum c. Copper d. Aluminum
5. Brass is
a. An Element b. A Compound c. A Mixture d. An Alloy

6. Bronze is an alloy of
a. Copper and Zinc b. Lead and Copper c. Copper and Tin d. Barium, Zinc and Iron
7. Which of the following metals is often found in pure state?
a. Copper b. Iron c. Gold d. Aluminum
8. Which metal is extracted from Haematite?
a. Tin b. Iron c. Manganese d. Cadmium
9. Rocks rich in metals with economic value are known as
a. Metalloids b. Ores c. Allotropes d. slag
10. An alloy is a
a. Compound of three elements. b. Solid Solution of two or more metals
c. Heterogeneous mixture. d. Element in impure form
11.If a metal ore is called "pyrites" then it most probably has
a. Chlorine b. Oxygen c. Sulphur d. Nitrogen
12. Often to prevent corrosion, metals are galvanized by covering them with a layer of
a. Copper b. Sodium c. Zinc d.Tin
13. What is not true about Tantalum?
a. It is classified as a "refractory" metal
b. Tantalum oxide is reduced with molten sodium to produce tantalum metal in powder form.
c. Its ore minerals include scheelite
d.It is found in hard rock deposits such as *granites*, *carbonites* and *pegmatites*

Exercise.3.

Multiple choice questions.

1.If nitrogen is the main element of fertilisers then fertilisers are classified as
a. NPK fertilisers. b. organic fertilisers. c. Nitrogen fertilisers. d. inorganic fertilisers.
2.Increased ratio of chemical nutrients in ecosystem is classified as watses
a. Triplication b. Eutrophication c. Crystallization d. Distillation
3.Greenhouse gas which can be emitted from storage of nitrogen based fertilisers is
a. Nitrogen monoxide b. Nitrogen dioxide c. Oxygen d. carbondioxide
4.Organic fertilisers can be derived from
a. Animal wastses b. All natural materials. c. plant and animal materials d. plants material only.
5. Which of the following elements is a trace element
a. Ca b. N c. Fe d. Mg.
6. Which of the following compounds a good source of phosphorous for plants.
a. $Ca_3(PO_4)_2$ b. H_3PO_4 c. $Ca_2(HPO_4)$ d. $CaSO_4$
7. Find by calculation, the best source of nitrogen.
a. Sodium nitrate. b. ammonium nitrate
c. ammonium sulphate. d. urea (CH_4N_2O).
8. An (1g) impure sample of ammomiumsulphate was boiled with aqueous sodium hydroxide. The ammonia evolved was nuetraliled by 30cm^3 of 0.1 mol dm^{-3}hydrochloric acid.
Calculate the percentage by mass of nitrogen in the sample of the salt. (N=14).
a. 5.1% b.3.2% c. 4.2% d.6%