

Model Question Paper
d- Block Elements - Part III

12th Standard

Chemistry

Reg.No. :

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I. Answer all the questions.

II. Use Blue pen only.

Time : 01:15:00 Hrs

Total Marks : 70

5 x 1 = 5

Section-A

- 1) In the extraction of Cu, the reaction which does not take place in the Bessemer converter is
(a) $2CuFeS_2 + O_2 \rightarrow Cu_2S + FeS + SO_2$ (b) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$ (c) $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$
(d) $2FeS + 3O_2 \rightarrow 2FeO + 2SO_2$
- 2) Select the wrong statement
(a) All cuprous salts are blue in colour (b) Transition metals are highly reactive (c) All cuprous salts are white in colour (d) Mercury is a liquid metal
- 3) Choose the wrong statement regarding $K_2Cr_2O_7$
(a) It is a powerful oxidising agent (b) It is used in tanning industry (c) It is soluble in water (d) It reduces ferric sulphate to ferrous sulphate
- 4) For a transition metal ion, the effective magnetic moment in BM is given by the formula
(a) $\sqrt{n(n-1)}$ (b) $\sqrt{n(n+1)}$ (c) $\sqrt{n(n+2)}$ (d) $\sqrt{n(n+1)(n+2)}$
- 5) The correct statement in respect of d-block elements is
(a) They are all metals (b) They show variable valency (c) They form coloured ions and complex salts (d) All above statement are correct.

Section-B

6 x 3 = 18

- 6) d-block elements are referred as transition elements. Why?
- 7) Zirconium and Hafnium have almost equal atomic radii. Why?
- 8) Sc^{3+} , Ti^{4+} , Cu^+ , Zn^+ and Zn^{2+} ions are colourless. Why?
- 9) Why are transition metal ions coloured?
- 10) Zn, Cd, Hg do not form coloured compounds. Why?
- 11) Most of transition metals and their compounds have catalytic activity. Why?

Section-C

5 x 5 = 25

- 12) A sulphate compound of group 11. This compound is also called as Blue vitriol. The compound undergoes decomposition at various temperature
 $A \xrightarrow{373k} B \xrightarrow{503k} C \xrightarrow{423k} D$ Identify the compounds A, B, C and D
- 13) A compound of chromium, in which chromium exists in +6 oxidation state. Its chief ore (A) on roasting with molten alkali gives compound (B). This compound on acidification gave compound C. Compound C on treatment with KCl gave compound D. Identify the compounds A, B, C and D. Explain with proper chemical reactions.
- 14) A sulphate compound of group 11. This compound is also called as Blue vitriol. The compound undergoes decomposition at various temperature
 $A-3-0-5K \rightarrow B-3-7-3K \rightarrow C-4-2-3K \rightarrow D$
Identify the compounds A, B, C and D.
- 15) A reddish brown metal A on heating to redness in the presence of air gives B which is black in colour. B dissolves in dil. H_2SO_4 to give C which is blue crystal. On heating to $230^\circ C$, C gives D which is white colour, which on further heating to $720^\circ C$ gives back B. What are A, B, C and D? Explain the reactions.
- 16) A bluish white metal when treated with dilute nitric acid gives A along with zinc nitrate and water. With very dilute nitric acid, it gives B along with zinc nitrate and water. The metal when heated with air gives C. What are A, B and C? Explain the reactions.

Section-D

2 x 10 = 20

- 17) a) Why do transition elements form alloys?
b) Explain the action of moist air on copper.
- 18) a) What happens when copper is heated in the presence of oxygen?
b) Explain the action of copper with con. H_2SO_4 .
