

Date Planned : __ / __ / __	Daily Tutorial Sheet-1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration : _____

- How do we differentiate between Fe^{3+} and Cr^{3+} in group III ? (2002)
 (A) By taking excess of NH_4OH solution (B) By increasing NH_4^+ ion concentration
 (C) By decreasing OH^- ion concentration (D) Both (B) and (C)
- The most stable ion is : (2002)
 (A) $[\text{Fe}(\text{OH})_3]^{3-}$ (B) $[\text{Fe}(\text{Cl})_6]^{3-}$ (C) $[\text{Fe}(\text{CN})_6]^{3-}$ (D) $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$
- Arrange Ce^{3+} , La^{3+} , Pm^{3+} and Yb^{3+} in increasing order of their ionic radii : (2002)
 (A) $\text{Yb}^{3+} < \text{Pm}^{3+} < \text{Ce}^{3+} < \text{La}^{3+}$ (B) $\text{Ce}^{3+} < \text{Yb}^{3+} < \text{Pm}^{3+} < \text{La}^{3+}$
 (C) $\text{Yb}^{3+} < \text{Pm}^{3+} < \text{La}^{3+} < \text{Ce}^{3+}$ (D) $\text{Pm}^{3+} < \text{La}^{3+} < \text{Ce}^{3+} < \text{Yb}^{3+}$
- Most common states of Ce (cerium) are : (2002)
 (A) +2, +3 (B) +2, +4 (C) +3, +4 (D) +3, +5
- Which of the following ions has the maximum magnetic moment ? (2002)
 (A) Mn^{2+} (B) Fe^{2+} (C) Ti^{2+} (D) Cr^{2+}
- For making good quality mirrors, plates of float glass are used. These are obtained by floating molten glass over a liquid metal which does not solidify before glass. The metal used can be : (2003)
 (A) mercury (B) tin (C) sodium (D) magnesium
- Which one of the following nitrates will leave behind a metal on strong heating ? (2003)
 (A) Ferric nitrate (B) Copper nitrate
 (C) Manganese nitrate (D) Silver nitrate
- The radius of La^{3+} (Atomic number of La = 57) is $1.06 \text{ \AA}$. Which one of the following given values will be closest to the radius of Lu^{3+} (Atomic number of Lu = 71) ? (2003)
 (A) $1.60 \text{ \AA}$ (B) $1.40 \text{ \AA}$ (C) $1.06 \text{ \AA}$ (D) $0.85 \text{ \AA}$
- What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid ? (2003)
 (A) Cr^{3+} and $\text{Cr}_2\text{O}_7^{2-}$ are formed (B) $\text{Cr}_2\text{O}_7^{2-}$ and H_2O are formed
 (C) CrO_4^{2-} is reduced to +3 state of Cr (D) CrO_4^{2-} is oxidised to +7 state of Cr
- The number of d-electrons in Fe^{2+} (Atomic number Fe = 26) ions is : (2003)
 (A) 3 (B) 4 (C) 5 (D) 6
- The atomic numbers of vanadium (V), chromium (Cr), manganese (Mn) and iron (Fe) are respectively 23, 24, 25 and 26. Which one of these may be expected to have the highest second ionisation enthalpy ? (2003)
 (A) V (B) Cr (C) Mn (D) Fe
- A reduction in atomic size with increase in atomic number is a characteristic of elements of : (2003)
 (A) high atomic masses (B) d-block
 (C) f-block (D) radioactive series

- 13.** A red solid is insoluble in water. However it becomes soluble if some KI is added to water. Heating the red solid in a test tube results in liberation of some violet coloured fumes and droplets of a metal appear on the cooler parts of the test tube. The red solid is : (2003)
- (A) $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$ (B) HgI_2 (C) HgO (D) Pb_3O_4
- 14.** The correct order of magnetic moments (spin only values in B.M.) among is : (2004)
(Atomic numbers : Mn = 25, Fe = 26, Co = 27)
- (A) $[\text{MnCl}_4]^{2-} > [\text{CoCl}_4]^{2-} > [\text{Fe}(\text{CN})_6]^{4-}$ (B) $[\text{MnCl}_4]^{2-} > [\text{Fe}(\text{CN})_6]^{4-} > [\text{CoCl}_4]^{2-}$
(C) $[\text{Fe}(\text{CN})_6]^{4-} > [\text{MnCl}_4]^{2-} > [\text{CoCl}_4]^{2-}$ (D) $[\text{Fe}(\text{CN})_6]^{4-} > [\text{CoCl}_4]^{2-} > [\text{MnCl}_4]^{2-}$
- 15.** Cerium (Z = 58) is an important members of the lanthanides. Which of the following statements about cerium is incorrect ? (2004)
- (A) The common oxidation states of cerium are +3 and +4.
(B) The +3 oxidation state of cerium is more stable than +4 oxidation state.
(C) The +4 oxidation state of cerium is not known in solutions.
(D) Cerium (IV) acts as an oxidising agent.