

Date Planned : __ / __ / __	Daily Tutorial Sheet-2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration : _____

16. Excess of KI reacts with CuSO_4 solution and then $\text{Na}_2\text{S}_2\text{O}_3$ solution is added to it. Which of the statements is incorrect for this reaction ? (2004)
- (A) Cu_2I_2 is formed (B) CuI_2 is formed
(C) $\text{Na}_2\text{S}_2\text{O}_3$ is oxidised (D) Evolved I_2 is reduced
17. Of the following outer electronic configurations of atoms, the highest oxidation state is achieved by which one of them ? (2004)
- (A) $(n-1)d^8ns^2$ (B) $(n-1)d^5ns^2$ (C) $(n-1)d^3ns^2$ (D) $(n-1)d^5ns^1$
18. The lanthanide contraction is responsible for the fact that : (2005)
- (A) Zr and Y have about the same radius
(B) Zr and Nb have similar oxidation state
(C) Zr and Hf have about the same radius
(D) Zr and Zn have the same oxidation state
19. Calomel (Hg_2Cl_2) on reaction with ammonium hydroxide gives : (2005)
- (A) HgNH_2Cl (B) $\text{NH}_2 - \text{Hg} - \text{Hg} - \text{Cl}$
(C) Hg_2O (D) HgO
20. The oxidation state of chromium in the final product formed by the reaction between KI and acidified potassium dichromate solution is : (2005)
- (A) +4 (B) +6 (C) +2 (D) +3
21. Heating mixture of Cu_2O and Cu_2S will be : (2005)
- (A) $\text{Cu} + \text{SO}_2$ (B) $\text{Cu} + \text{SO}_3$ (C) $\text{CuO} + \text{CuS}$ (D) Cu_2SO_3
22. The "spin-only" magnetic moment [in units of Bohr magneton, (μ_B)] of Ni^{2+} in aqueous solution would be : (Atomic number of Ni = 28) (2006)
- (A) 2.84 (B) 4.90 (C) 0 (D) 1.73
23. Nickel ($Z = 28$) combines with a uninegative monodentate ligand X^- to form a paramagnetic complex $[\text{NiX}_4]^{2-}$. The number of unpaired electron(s) in the nickel and geometry of this complex ion are, respectively : (2006)
- (A) one, tetrahedral (B) two, tetrahedral
(C) one, square planar (D) two, square planar
24. Which of the following factors may be regarded as the main cause of lanthanide contraction ? (2006)
- (A) Poor shielding of one of 4f-electron by another in the subshell
(B) Effective shielding of one of 4f-electrons by another in the subshell
(C) Poorer shielding of 5d-electrons by 4f-electrons
(D) Greater shielding of 5d-electrons by 4f-electrons

25. The actinides exhibit more number of oxidation states in general than the lanthanides. This is because :
 (A) the 5f orbitals extend further from the nucleus than the 4f orbitals (2007)
 (B) the 5f orbitals are more buried than the 4f orbitals
 (C) there is a similarity between 4f and 5f orbitals in their angular part of the wave function
 (D) the actinides are more reactive than the lanthanides
26. Identify the incorrect statement among the following : (2007)
 (A) 4f and 5f-orbitals are equally shielded
 (B) d-Block elements show irregularity and erratic chemical properties among themselves
 (C) La and Lu have partially filled d-orbitals and no other partially filled orbital
 (D) The chemistry of various lanthanides is very similar
27. In which of the following octahedral complexes of Co (Atomic number 27), will the magnitude of Δ_{oct} be the highest ? (2008)
 (A) $[\text{Co}(\text{NH}_3)_6]^{3+}$ (B) $[\text{Co}(\text{CN})_6]^{3-}$ (C) $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$ (D) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$
28. Larger number of oxidation states are exhibited by the actinides than those by the lanthanides, the main reason being : (2008)
 (A) more reactive nature of the actinides than the lanthanides.
 (B) 4f orbitals more diffused than the 5f orbitals.
 (C) lesser energy difference between 5f and 6d than between 4f and 5d orbitals.
 (D) more energy difference between 5f and 6d than between 4f and 5d orbitals.
29. In context with the transition elements, which of the following statements is incorrect ?  (2009)
 (A) In addition to the normal oxidation states, the zero oxidation state is also shown by these elements in complexes.
 (B) In the highest oxidation states, the transition metals shows basic character and form cationic complexes.
 (C) In the highest oxidation states of the first five transition elements (Sc to Mn), all the 4s and 3d electrons are used for bonding.
 (D) Once the d^5 configuration is exceeded, the tendency to involve all the 3d-electrons in bonding decreases.
30. Knowing that the chemistry of lanthanides (Ln) is dominated by its +3 oxidation state, which of the following statements is incorrect ? (2009)
 (A) Because of the large size of the Ln(III) ions the bonding in its compounds is predominantly ionic in character.
 (B) The ionic sizes of Ln(III) decrease in general with increasing atomic number.
 (C) Ln(III) compounds are generally colourless.
 (D) Ln(III) hydroxides are mainly basic in character.