

Date Planned : __ / __ / __	Daily Tutorial Sheet-3	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Advanced Archive	Exact Duration : _____

31. Name the structure of silicates in which three oxygen atoms of $[\text{SiO}_4]^{4-}$ are shared is : (2005)
- (A) pyrosilicate (B) sheet silicate
(C) linear chain silicate (D) three-dimensional silicate
32. Starting from SiCl_4 , prepare the following in steps not exceeding the number given in parenthesis (give reactions only) (2005)
- (i) Silicon (1 step)
(ii) Linear silicon containing methyl group only (2 steps)
(iii) Na_2SiO_3 (3 steps)
33. Match the following : (2006)
- | Column-I | | Column-II | |
|----------|---|-----------|-------------------|
| (A) | $\text{Bi}^{3+} \longrightarrow (\text{BiO})^+$ | (p) | Heat |
| (B) | $[\text{AlO}_2]^- \longrightarrow \text{Al}(\text{OH})_3$ | (q) | Hydrolysis |
| (C) | $\text{SiO}_4^{4-} \longrightarrow \text{Si}_2\text{O}_7^{6-}$ | (r) | Acidification |
| (D) | $(\text{B}_4\text{O}_7^{2-}) \longrightarrow [\text{B}(\text{OH})_3]$ | (s) | Dilution by water |
34. $\text{B}(\text{OH})_3 + \text{NaOH} \rightleftharpoons \text{NaBO}_2 + \text{Na}[\text{B}(\text{OH})_4] + \text{H}_2\text{O}$
How can this reaction is made to proceed in forward direction? (2006)
- (A) Addition of cis 1, 2-diol (B) Addition of borax
(C) Addition of trans 1, 2-diol (D) Addition of Na_2HPO_4
35. **Statement-I :** Boron always forms covalent bond. (2007)
Statement-II : The small size of B^{3+} favours formation of covalent bond.
- (A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I
(B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I
(C) Statement-I is True, Statement-II is False
(D) Statement-I is False, Statement-II is True
36. **Statement-I :** In water, orthoboric acid behaves as a weak monobasic acid. (2007)
Statement-II : In water, orthoboric acid acts as a proton donor.
- (A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I
(B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I
(C) Statement-I is True, Statement-II is False
(D) Statement-I is False, Statement-II is True

37. H_3BO_3 is : (2007)
 (A) monobasic and weak Lewis acid (B) monobasic and weak Bronsted acid
 (C) monobasic and strong Lewis acid (D) tribasic and weak Bronsted acid
38. **Statement-I** : Pb^{4+} compound are stronger oxidizing agent than Sn^{2+} compounds. (2008)
Statement-II : The higher oxidation states for the group 14 elements are more stable for the heavier members of the group due to 'inert pair effect'.
 (A) Statement-I is True, Statement-II is True and Statement-II is a correct explanation for Statement-I
 (B) Statement-I is True, Statement-II is True and Statement-II is NOT a correct explanation for Statement-I
 (C) Statement-I is True, Statement-II is False
 (D) Statement-I is False, Statement-II is True
- *39. In the reaction, $2\text{X} + \text{B}_2\text{H}_6 \longrightarrow [\text{BH}_2(\text{X})_2]^+ [\text{BH}_4]^-$. The amine(s) X is/are : (2009)
 (A) NH_3 (B) CH_3NH_2 (C) $(\text{CH}_3)_2\text{NH}$ (D) $(\text{CH}_3)_3\text{N}$
40. The value of n in the molecular formula $\text{Be}_n\text{Al}_2\text{Si}_6\text{O}_{18}$ is : (2010)
- *41. With respect to graphite and diamond, which of the statement (s) given below is/are correct. (2012)
 (A) Graphite is harder than diamond
 (B) Graphite has higher electrical conductivity than diamond
 (C) Graphite has higher thermal conductivity than diamond
 (D) Graphite has higher C – C bond order than diamond
- *42. The correct statement(s) for orthoboric acid is/are : (2014)
 (A) It behaves as a weak acid in water due to self ionization
 (B) Acidity of its aqueous solution increases upon addition of ethylene glycol
 (C) It has a three-dimensional structure due to hydrogen bonding
 (D) It is a weak electrolyte in water
43. Three moles of B_2H_6 are completely reacted with methanol. The number of moles of boron containing products formed is _____. (2015)
44. Under hydrolytic conditions, the compounds used for preparation of linear polymer and for chain termination, respectively, are : (2015)
 (A) CH_3SiCl_3 and $\text{Si}(\text{CH}_3)_4$ (B) $(\text{CH}_3)_2\text{SiCl}_2$ and $(\text{CH}_3)_3\text{SiCl}$
 (C) $(\text{CH}_3)_2\text{SiCl}_2$ and CH_3SiCl_3 (D) SiCl_4 and $(\text{CH}_3)_3\text{SiCl}$
45. The increasing order of atomic radii of the following Group 13 elements is : (2016)
 (A) $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$ (B) $\text{Ga} < \text{Al} < \text{In} < \text{Tl}$
 (C) $\text{Al} < \text{In} < \text{Ga} < \text{Tl}$ (D) $\text{Al} < \text{Ga} < \text{Tl} < \text{In}$
46. The crystalline form of borax has : (2016)
 (A) tetranuclear $[\text{B}_4\text{O}_5(\text{OH}_4)]^{2-}$ unit (B) all boron atoms in the same plane
 (C) equal number of sp^2 and sp^3 hybridized boron atoms
 (D) one terminal hydroxide per boron atom

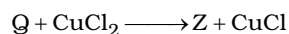
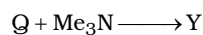
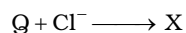
47. Among the following, the correct statement(s) is/(are) :



(2017)

- (A) $\text{Al}(\text{CH}_3)_3$ has the three – centre two-electron bonds in its dimeric structure
- (B) BH_3 has the three-centre two-electron bonds in its dimeric structure
- (C) AlCl_3 has the three-centre two-electron bonds in its dimeric structure
- (D) The Lewis acidity of BCl_3 is greater than that of AlCl_3

48. A tin chloride Q undergoes the following reactions (not balanced)



X is a monoanion having pyramidal geometry. Both Y and Z are neutral compounds. Choose the correct options(s) :

(2019)

- (A) The central atom in Z has one lone pair of electrons
- (B) The oxidation state of the central atom in Z is +2
- (C) The central atom in X is sp^3 hybridized
- (D) There is a coordinate bond Y