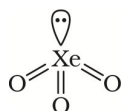


Daily Tutorial Sheet 9

JEE Advanced (Archive)

121.(A) Argon being inert, creates inert atmosphere to prevent the oxidation of metal by O_2 of air.

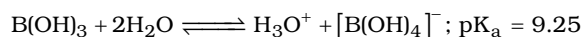
122.(C) In XeO_3 there are total of 4 electron pairs around central atom. Out of which 3 are bonding electron pairs and one is non-bonding electron pair. Therefore, the hybridisation of central atom is sp^3 and geometry is trigonal pyramidal.



123.(A) Xenon fluorides are strongly oxidising, since xenon is more stable in its atomic state.

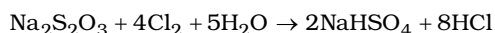
124.(C) Statement-I is correct but Statement-2 incorrect.

Orthoboric acid (H_3BO_3) is soluble in water and behaves as weak monobasic acid. It does not donate protons like most acids, but rather it accepts OH^- ions. It is, therefore, Lewis acid and is better written as $B(OH)_3$.



125.(A) Both statements are true. Boron forms only covalent compounds (bonds) because small sized B ion polarizes the corresponding anion largely.

126.(B) Sodium thiosulphate ($Na_2S_2O_3$) shows reducing action as it is oxidised by chlorine.



127.(C) Among phosphates and nitrates, nitrates are more soluble in water hence less abundant in earth crust.

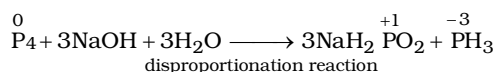
Further oxidation of nitrates (NO_3^-) is not possible because its oxidation state is +5 which is its highest oxidation state.

128.(C) The actual bond angle is in order of $NH_3 > PH_3 > AsH_3 > SbH_3$

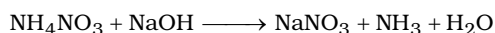
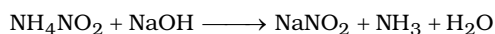
$106.5^\circ \quad 93.5^\circ \quad 91.5^\circ \quad 91.3^\circ$

The bond angle in ammonia is less than $109^\circ 28'$ due to repulsion between lone pair present on nitrogen atom and bonded pair of electrons. The decreased bond angle in other hydrides can be explained by the fact that the sp^3 hybridization becomes less and less distinct with increasing size of the central atom.

129.(B) In disproportionation reaction, the same element of compound is oxidized and reduced.



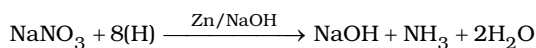
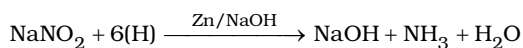
130.(AB) When ammonium salt NH_4NO_3 or NH_4NO_2 (ammonium salts are colourless) is boiled with excess of NaOH, ammonia (NH_3) gas is evolved as follows :



The NH_3 gas evolved is non-flammable gas.

When the gas evolution cases we are left with $NaNO_2$ or $NaNO_3$ in solution.

These salts get reduced when Zn is added to this solution containing salt (NaNO_2 or NaNO_3) and excess NaOH and NH_3 gas is evolved.



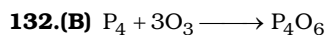
Thus the colourless salt [H] is either NH_4NO_2 or NH_4NO_3 .

Thus (A) and (B) are correct answers

[NOTE : NaCl formed has no reaction with NaOH]

131.(C) In group-14 elements, the lower (and not higher) oxidation states are more stable for heavier members of the group due to inert pair effect.

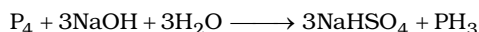
Thus Pb^{4+} is less stable as compared to Sn^{4+} (lead is heavier than Tin). Therefore Pb^{4+} acts as a strong oxidising agent than Sn^{4+} . Hence Statement-1 is false and Statement-2 is true. Thus the correct answer is option (C).



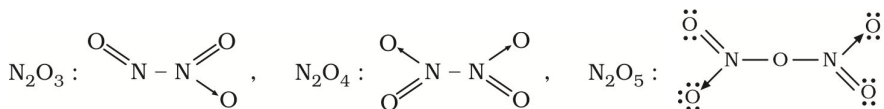
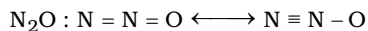
Nitrogen prevents further oxidation of P_4O_6 to P_4O_{10} .

P_4 when treated with dry O_2 gives P_4O_6 and finally P_4O_{10} .

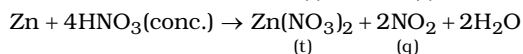
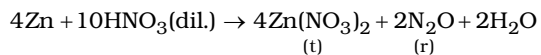
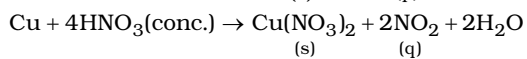
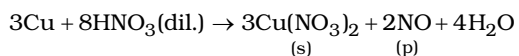
With moist oxygen, P_4 gives H_3PO_3 .



133.(ABC)



134. A-(p, s); B-(q, s); C-(r, t); D-(q, t)



135.(6) Coordination number of Al is 6. It exists in ccp lattice with 6 coordinate layer structure.