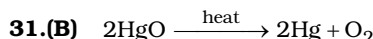
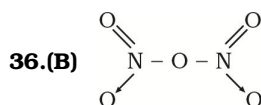
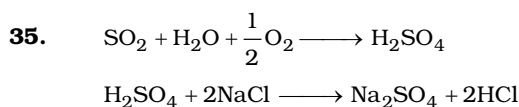
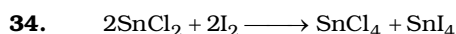
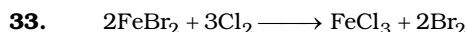


Daily Tutorial Sheet 3

JEE Advanced (Archive)



The strength of H–X bond decreases as we move down the group. On moving down the group the atomic size increases so H–X bond length increases. The larger the H–X bond length, lower is the bond energy and so lesser is the bond strength.

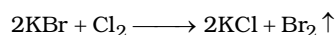


The structure clearly shows the presence of covalent and co-ordinate bonds.

37.(AB) Because of high melting point (2050°C), pure alumina cannot be electrolysed. Hence a mixture of alumina, cryolite (m.p. 1000°C) and calcium fluoride (to lower the temperature of the melt) is electrolysed at about 900°C.

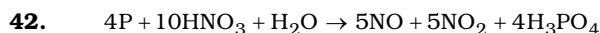
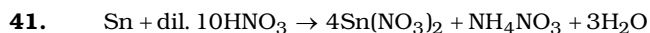
NOTE : The function of cryolite is to increase the electrical conductivity of the electrolyte, and to lower the temperature of the melt.

38.(B) Since Cl_2 is a stronger oxidising agent than Br_2 , so Cl_2 water will liberate bromine from KBr solution.



39.(A) NF_3 is least basic due to highest value of electronegativity of fluorine.

40.(D) The colour of NO_2 is reddish brown. All others are colourless.



As the oxidation state of Cl increases (or the number of oxygen atoms increases), the –ve charge dispersal becomes more and more from Cl atom due to higher electronegativity value of oxygen, Lesser the charge on Cl atom more is the stability.



In case of oxides of non-metals, the acid strength increases with increase in oxidation state. The oxidation state of various increase are Si = +4, C = +4, N = +5, S = +6 in the given oxides.

Due to the shell size of C-atom, CO_2 is more acidic than SiO_2 .

45. Oxygen is second most electronegative (fluorine being the most electronegative) and so oxygen shows negative oxidation state in its compounds. Because it needs 2 electrons to complete its octet ($O; 1s^2 2s^2 2p^4$) it shows -2 oxidation state.

Sulphur also needs 2 electrons to complete its octet ($ns^2 np^2$ like oxygen) so it shows -2 oxidation state. However due to availability of vacant d-orbitals in its valence orbital it also shows oxidation states of $+2$, $+4$ and $+6$.