Hybridisation

221. Arrange the hydra-acids of halogens in increasing order of acidity

(a) $HF < HCl < HBr < HI$

(b) $HI < HBr < HCl < HF$

(c) $HF < HBr < HI < HCl$

(d) $HF < HI < HBr < HCl$

222. Which one has sp^2 –hybridisation

(a) CO_2 (b) N_2O

(c) SO_2 (d) CO

223. Among the following compounds the one that is polar and has central atom with sp^2 –hybridization is

(a) H_2CO_3 (b) BF_3

(c) SiF_4 (d) $HClO_2$

224. The molecule which is pyramid shape is

(a) PCl_3 (b) CO_3^{2-}

(c) SO_3 (d) NO_3^-

225. Which of the following has a linear structure

(a) CCl_4 (b) C_2H_2

(c) SO_2 (d) C_2H_4

226. In a regular octahedral molecule, MX_6, the number $X-M-X$ bonds at 180° is

(a) Six (b) Four

(c) Three (d) Two

227. sp^3d^2 hybrid orbitals are

(a) Linear bipyramidal

(b) Pentagonal

(c) Trigonal bipyramidal

(d) Octahedral

228. In an octahedral structure, the pair of *d* orbitals involved in d^2sp^3 hybridization is

(a) d_{x^2}, d_{xz} (b) d_{xy}, d_{yz}

(c) $d_{x^2-y^2}, d_{z^2}$ (d) $d_{xz}, d_{x^2-y^2}$

229. The correct order of bond angles (smallest first) in H_2S, NH_3, BF_3 and $SiH_4$is

(a) $H_2S < NH_3 < SiH_4 < BF_3$

(b) $NH_3 < H_2S < SiH_4 < BF_3$

(c) $H_2S < SiH_4 < NH_3 < BF_3$

(d) $H_2S < NH_3 < BF_3 < SiH_4$

230. Which one of the following has the regular tetrahedral structure

(a) BF_4^- (b) SF_4

(c) XeF_4 (d) $[Ni(CN)_4]^{2-}$

(Atomic no. : $B = 5, S = 16, Ni = 28, Xe = 54$)

231. The states of hybridazation of boron and oxygen atoms in boric acid (H_3BO_3) are respectively

(a) sp^3 and sp^2

(b) sp^2 and sp^3

(c) sp^2 and sp^2

(d) $sp^3$and sp^3

232. The hybridisation in BF_3 molecule is

(a) sp (b) sp^2

(c) sp^3 (d) sp^3d

233. Among the compounds, BF_3, NCl_3, H_2S, SF_4 and $BeCl_2$, identify the ones in which the central atom has the same type of hybridisation

(a) BF_3 and NCl_3

(b) $H_2S$and $BeCl_2$

(c) $BF_3, NCl_3$and H_2S

(d) $SF_4$and $BeCl_2$

(e) NCl_3 and H_2S

234. The molecule of CO_2 has 180° bond angle. It can be explanid on the basis of

(a) sp^3 hybridisation

(b) sp^2 hybridisation

(c) sp hybridisation

(d) d^2sp^3 hybridisation

235. sp^3 hybridisation is found in

(a) CO_3^{2-} (b) BF_3

(c) NO_3^- (d) NH_3

236. Which set hydridisation is correct for the following compounds

NO_2, SF_4 PF_6^-

(a) sp, sp^2, sp^3

(b) sp, sp^3d, sp^3d^2

(c) sp^2, sp^3, d^2sp^3

(d) sp^3, sp^3d^2, sp^3d^2

237. The state of hybridisation of B in BCl_3 is

(a) sp (b) sp^2

(c) sp^3 (d) sp^2d^2

238. The hybrid state of sulphur in SO_3 molecule is

(a) sp^3d (b) sp^3

(c) sp^3d^2 (d) sp^2

239. Which of the following molecules has pyramidal shape

(a) PCl_3 (b) SO_3

(c) CO_3^{2-} (d) NO_3^-

240. The hybrdization of IF_7 is

(a) sp^3d^3 (b) sp^2d

(c) d^2sp^3 (d) sp^3