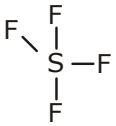
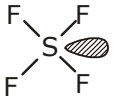
361. [D]


sp^3d TBP

$\Rightarrow$ asial and equitorial, two types of F – S – F bonds are present in the molecule SF_4.

362. [A]


sp^3 tetrahedral


sp^3d, see-saw

(B) 
sp^3d, linear

O = C = O sp, linear

(C) BF_3 sp^2, trigonal planer PCl_5 sp^3d, TBP

As both are linear in shape.

363. [B]

$Zn + Conc\ HNO_3 \longrightarrow Zn(NO_3)_2 + NO_2 + H_2O$

$Zn + dil.\ HNO_3 \longrightarrow Zn(NO_3)_2 + N_2O + H_2O$

364. [D]

N_2, total e^- = 14

$\sigma 1s^2, \sigma^* 1s^2, \sigma 2s^2, \sigma^* 2s^2, \pi 2py, \sigma 2px^2, \pi^2 2pz$ $\pi^* 2py, \sigma^* 2px, \pi^* 2pz$

$\Rightarrow$ since $\sigma 2px$ is highest occupied molecular orbital (HOMO) hence e^- will be removed from $\sigma 2px$ for the formation of N_2^+ from that of N_2.

365. [D]

In (1) hydrogen bonding decreases $\theta < 60^o$

In (2) dipole-dipole repulsion increases $\theta > 60^o$

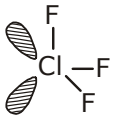
In (3) θ remains 60^o

Hence, the correct order is 2 < 3 < 1.

366. [B]

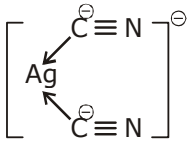
The mlecular of water consists of two hydrogen atoms bonded to oxygen atom by covalent bonds. Because of the polar nature of water molecular, the water molecules are held together by intermolecular hydrogen bonds. In this arrangement, each oxygen is tetrahedrally surrounded by four hydrogen atom ; two by covalent bond and two hydrogen bonds.

367. [C]



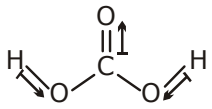
No. of L.P. = 2

368. [C]



No. of π- bond = 4

369. [D]



Since structure is not symmetrical hence bond moment can not concel each other.

370. [B]

No. (nitric oxide) total e^- = 15

$$B.O. = 1/2 \begin{vmatrix} 2 & 2 \\ 2 & 2 \\ 6 & 1 \end{vmatrix} = 1/2\ (6-1) = 2.5$$

371. [A]

$(NH_4)_2SO_4 \longrightarrow NH3 + H_2SO_4$

$HNO_3 \longrightarrow H_2O + NO_2 + O_2$

$(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + H_2O$

$NH_4NO_3 \longrightarrow N_2O + H_2O$

372. [B]

px – py combination is not possible

373. [B]

(A) H_2^- total e^- = 3 $\Rightarrow$ paramagentic

(B) H_2 , total e^- = 2 $\Rightarrow$ diamagntic

(C) H_2^+ total e^- = 1 $\Rightarrow$ paramagentic

(D) He_2^+ total e^- = 1 $\Rightarrow$ paramagentic

374. [C]

Ethylene is a planar molecule in which carbon atom is sp^2 hybridized.

375. [C]

S_2 molecule is paramagnetic like O_2 as both have two unpaired electrons.

376. [D]

$\sigma 1s^2$, $\sigma^* 1s^2$, $\sigma 2s^2$, $\sigma^* 2s^2$, $\sigma 2p^2x$, $\pi^2 2py$, $\pi^* 2py$ $\pi 2pz$, $\pi^* 2pz$

$\Rightarrow$ e^- is removed from $\pi^* 2py$ for mormation of O_2^+.

377. [A]

O_2^{2-} 18(e^-) all e^- paired

B_2 10 e^- $\Rightarrow$ unpaired electron

$\Rightarrow$ Paramagnetic

O_2^+ 13 e $\Rightarrow$ unpaired e^-

$\Rightarrow$ Paramagnetic

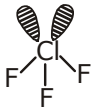
O_2 16 e^- $\Rightarrow$ unpaired e^-

$\Rightarrow$ Paramagnetic

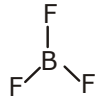
378. [C]

(A) AlF_3 (all Bonds equal ionic Bond e×,sl)

(B)  sp^3, Pyramidal

(C)  sp^3d

$\Rightarrow$ axial and equitorial Bond exist so all Bonds are not equal

(D)  sp^2

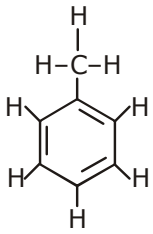
$\Rightarrow$ all Bond length equal

Chlorine atom in ClF_3 is sp^3d hybridized. hence bonds are not equal as it has distorted T–shape.

379. [B]

$PCl_5 \rightleftharpoons \overset{+}{PCl_4} + \overset{-}{PCl_6}$

380. [D]



No. of σ-bond = 15

No. of π-Bond = 3

381. [A]

I_3^+  sp^3

I_3^-  sp^3d

382. [D]

Smaller the size of ions and more the carge, more is the lattice energy.

383. [B]

For polyationic anions

T.S. × Ionic choraetler $\times \frac{1}{\phi}$

ϕ × size of cator

$\Rightarrow$ $Be^{2+} < Mg^{2+} < Ca^{2+} < K^+$

(Polarsing power)

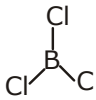
$\Rightarrow$ $BeCO_3 > MgCO_3 > CaCO_3 > K_2CO_3$

$\Rightarrow$ IV > II > III > I

384. [D]

Bond Anqle of too species will be same only if Both have some hybridizatio and have symmetrical strecture

 sp^2, 120°

 sp^2, 120°

385. [D]

$KO_2 \rightarrow K^+O_2^-$

$\Rightarrow$ O_2^- total e^- = 17

$\sigma 1s^2, \sigma^* 1s^2, \sigma 2s^2, \sigma^* 2s^2, \sigma \overset{2}{2pn},$

$\pi^2 2py \quad \pi^* 2py$

$\underset{\pi^2 2py}{\text{II}_2}$, $\underset{\pi^* 2pz}{\text{II}_1}$ $\sigma^* 2px$

unpaired e^-= 1

Magnetic moment = $\sqrt{n + (n+2)}$

$= \sqrt{1 \times 3}$ BM

= 1.73 BM

386. [C]

Here, A, B, C and D are O, F, Na and Mg, respectively hence the compounds formed by them are C_2A (Na_2O), DA(MgO), CB(NaF) and DB_2 (MgF_2), respectively.