# CHEMISTRY

41. (3)

Vapour pressure of a solvent is lowered by the presence of solute in it. Lowering in vapour pressure is a colligative property i.e., it depends on the no. of particles present in the solution. $Cu(NO_3)_2$ give the maximum no. of ions. (i.e., 3) so it causes the greatest lowering in vapour pressure of water.

42. (1)

43. (1)

$K_4[Fe(CN)_6]$ dissociates as $4K^+ + [Fe(CN)_6]^{4-}$, thus 1 molecule dissociates into five particles in the similar way $Al_2(SO_4)_3$ also gives five particles per molecule.

44. (3)

$$Na_2SO_4 \rightleftharpoons 2Na^+ + SO_4^{2-}$$
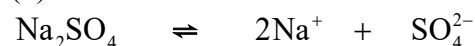
Mol. before diss. 1      0      0

Mol. after diss $1-\alpha$      $2\alpha$      $1\alpha$

$$i = \frac{Exp.C.P.}{Normal\,C.P.} = 1 - \alpha + 2\alpha + \alpha = 1 + 2\alpha$$

45. (2)

Molecular weight of $CH_3COOH = 60$

Acetic acid dimerises in benzene.

Hence the molecular weight of acetic acid in benzene $= 2 \times 60 = 120$.

46. (2)

Number of tetrahedral voids in the unit cell $= 2 \times$ number of atoms $= 2Z$.

47. (3)

Tetrahedral sites one double comparable to octahedral sites then ratio of X and Z respectively 2 : 1 since formula of the compound $X_2Z$.

48. (1)

There are two atoms in a *bcc* unit cell.

So, number of atoms in $12.08 \times 10^{23}$ unit cells $= 2 \times 12.08 \times 10^{23} = 24.16 \times 10^{23}$ atom.

49. (1)

$$M = \frac{\rho \times a^3 \times N_0 \times 10^{-30}}{z}$$

$$= \frac{10 \times (100)^3 \times (6.02 \times 10^{23}) \times 10^{-30}}{4} = 15.05$$

No. of atoms in 100 g $= \frac{6.02 \times 10^{23}}{15.05} \times 100$

$$= 4 \times 10^{25}.$$

50. (2)

In a unit cell, W atoms at the corner $= \frac{1}{8} \times 8 = 1$

O atoms at the centre of edges $= \frac{1}{4} \times 12 = 3$

Na atoms at the centre of the cube $= 1$

$W : O : Na = 1 : 3 : 1$, hence formula $= NaWO_3$