

**TOPICS : Solid State**

- The edge length of face centred unit cube cell is 508 pm. If the radius of the cation is 110 pm, the radius of anion is
  - 110 pm
  - 144 pm
  - 618 pm
  - 398 pm
- In cubic close packing (ccp) arrangement, the pattern of the successive layers will be designed as
  - AB , AB , AB.....etc.
  - AB , ABC , AB.....etc.
  - ABC , ABC , ABC,....etc.
  - None of these
- Schottky defect is likely to be found in
  - AgI
  - NaCl
  - ZnS
  - ZnO
- The edge lengths of the unit cells in terms of the radius of sphere constituting *fcc* , *bcc* and simple cubic unit cell are respectively.
  - $2\sqrt{2}r, \frac{4r}{\sqrt{3}}, 2r$
  - $\frac{4r}{\sqrt{3}}, 2\sqrt{2}r, 2r$
  - $2r, 2\sqrt{2}r, \frac{4r}{\sqrt{3}}$
  - $2r, \frac{4r}{\sqrt{3}}, 2\sqrt{2}r$
- In a cubic packed structure of mixed oxides, the lattice is made up of oxide ions. One-fifth of tetrahedral voids are occupied by divalent ( $X^{2+}$ ) ions, while one-half of the octahedral voids are occupied by trivalent ion ( $Y^{3+}$ ), then the formula of the oxide is
  - $XY_2O_4$
  - $X_2YO_4$
  - $X_4Y_5O_{10}$
  - $X_5Y_4O_{10}$
- The molar freezing point constant for water is  $1.86^\circ\text{C}/\text{m}$  . If 342 g of cane sugar ( $C_{12}H_{22}O_{11}$ ) is dissolved in 1000 g of water, the solution will freeze at
  - $-1.86^\circ\text{C}$
  - $1.86^\circ\text{C}$
  - $-3.92^\circ\text{C}$
  - $2.42^\circ\text{C}$
- For ideal solution with  $p_A^\circ > p_B^\circ$  which of the following is true?
  - $(x_A)_{\text{liquid}} = (x_A)_{\text{vapour}}$
  - $(x_A)_{\text{liquid}} > (x_A)_{\text{vapour}}$
  - $(x_A)_{\text{liquid}} < (x_A)_{\text{vapour}}$
  - There is no relationship between  $(x_A)_{\text{liquid}}$  and  $(x_A)_{\text{vapour}}$
- The vapour pressure of pure benzene and toluene are 160 and 60 torr respectively. The mole fraction of toluene in vapour phase in contact with equimolar solution of benzene and toluene is
  - 0.50
  - 0.16
  - 0.27
  - 0.73
- Solubility of a gas in a liquid increase with
  - increase of pressure and increase of temperature
  - decrease of pressure and increase of temperature.
  - Increase of pressure and decrease of temperature
  - decrease of pressure and decrease of temperature.
- What is the freezing point of a solution containing 8.1 g HBr in 100 g water, assuming that the acid to be 90% ionizes?
 
$$K_f(\text{H}_2\text{O}) = 1.86 \text{ K kg mol}^{-1}$$
  - $0.85^\circ\text{C}$
  - $-3.8^\circ\text{C}$
  - $0^\circ\text{C}$
  - $-3.5^\circ\text{C}$