

CALCULATIONS INVOLVING UNIT CELL DIMENSIONS

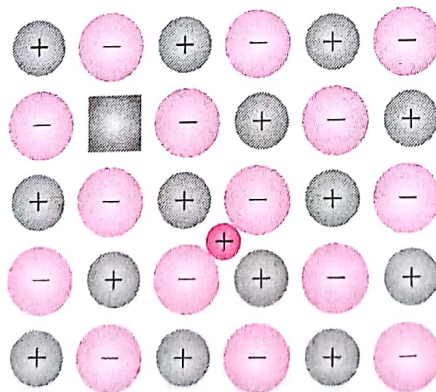
59. An element crystallises in a structure having a *fcc* unit cell of an edge 200 pm. If 200 g of this element contains 24×10^{23} atoms then its density is
- (a) 41.66 g cm^{-3} (b) 313.9 g cm^{-3}
(c) 8.117 g cm^{-3} (d) 400 g cm^{-3}
60. A unit cell of sodium chloride has four formula units. The edge length of the unit cell is 0.564 nm. What is the density of sodium chloride?
- (a) 3.89 g cm^{-3} (b) 2.16 g cm^{-3}
(c) 3 g cm^{-3} (d) 1.82 g cm^{-3}
61. The distance between Na^+ and Cl^- ions in NaCl with a density 3.165 g cm^{-3} is
- (a) 497 pm (b) 248.5 pm
(c) 234 pm (d) 538.5 pm
62. The unit cell of aluminium is a cube with an edge length of 405 pm. The density of aluminium is 2.70 g cm^{-3} . What is the structure of unit cell of aluminium?
- (a) Body-centred cubic cell
(b) Face-centred cubic cell
(c) End-centred cubic cell
(d) Simple cubic cell
63. The density of a metal which crystallises in *bcc* lattice with unit cell edge length 300 pm and molar mass 50 g mol^{-1} will be

- (a) 10 g cm^{-3} (b) 14.2 g cm^{-3}
 (c) 6.15 g cm^{-3} (d) 9.32 g cm^{-3}

64. How many lithium atoms are present in a unit cell with edge length 3.5 \AA and density 0.53 g cm^{-3} ? (Atomic mass of Li = 6.94)
 (a) 2 (b) 1 (c) 4 (d) 6
65. An element with atomic mass 100 has a *bcc* structure and edge length 400 pm. The density of element is
 (a) 10.37 g cm^{-3} (b) 5.19 g cm^{-3}
 (c) 7.29 g cm^{-3} (d) 2.14 g cm^{-3}
66. An element crystallising in body centred cubic lattice has an edge length of 500 pm. If its density is 4 g cm^{-3} , the atomic mass of the element (in g mol^{-1}) is (consider $N_A = 6 \times 10^{23}$)
 (a) 100 (b) 250
 (c) 125 (d) 150
67. Crystalline CsCl has density 3.988 g cm^{-3} . The volume occupied by single CsCl ion pair in the crystal will be
 (a) $7.014 \times 10^{-3} \text{ cm}^3$ (b) $7.014 \times 10^{-23} \text{ cm}^3$
 (c) $1.014 \times 10^{-3} \text{ cm}^3$ (d) $1.542 \times 10^{-5} \text{ cm}^3$

IMPERFECTIONS IN SOLIDS

68. Which is the defect represented by the given figure?



- (a) Schottky defect (b) Frenkel defect
 (c) Vacancy defect (d) Interstitial defect
69. What is the effect of Frenkel defect on the density of ionic solids?
 (a) The density of the crystal increases.
 (b) The density of the crystal decreases.
 (c) The density of the crystal remains unchanged.
 (d) There is no relationship between density of a crystal and defect present in it.