#76133 Chemistry, Other

An element with molar mass 63 g/mol forms a cubic unit cell with edge length of 360.8 pm if its density is 8.92 g/cm^3. What is the nature of the cubic unit cell.

Answer:

$d = (n \times M) / (a^3 \times N_A)$
where d – density of crystal;
n – number of atoms in crystal;
M – atomic mass;
N_A – Avogadro number.

$8.92 = (n \times 63) / ((3.608 \times 10^{-8})^3 \times 6.022 \times 10^{23})$
From this $n \approx 4$

4 atoms in the crystal indicates that cubic unit cell is hexagonal with close packing.