

- A binary alloy has a face-centered cubic structure with atoms of element A in the faces and atoms of element B at the corners. What is the formula of the alloy? Explain your reasoning.

Atoms on the faces are shared between 2 cells: they contribute $\frac{1}{2}$ to each. There are 6 faces:

$$\text{number of A atoms} = 6 \times \frac{1}{2} = 3$$

Atoms on the corners are shared between 8 cells: they contribute $\frac{1}{8}$ to each. There are 8 corners:

$$\text{number of B atoms} = 8 \times \frac{1}{8} = 1$$

The stoichiometry is thus A : B = 3 : 1 so the formula is A_3B .

THE REMAINDER OF THIS PAGE IS FOR ROUGH WORKING ONLY.