

Answer on Question #51567, Physics, Solid State Physics

What is the Bravais lattice formed by all lattice points which have the Cartesian coordinates (x,y,z) such that

- i) x, y and z are all even numbers
- ii) x, y and z are either all even numbers or all odd numbers.

Answer:

- i) The lattice will be simple cubic with lattice constants $a = 2$, if (x, y, z) are all even.
- ii) The lattice will be body-centered cubic with lattice constants $a = 2$, if (x, y, z) are all even or all odd. We will get a lattice with (x, y, z) all odd, and each new lattice point is in the center of the cubic of old lattice, if we shift the lattice in part (i) as $(x, y, z) \rightarrow (x+1, y+1, z+1)$. Hence we obtain a body-centered cubic lattice.