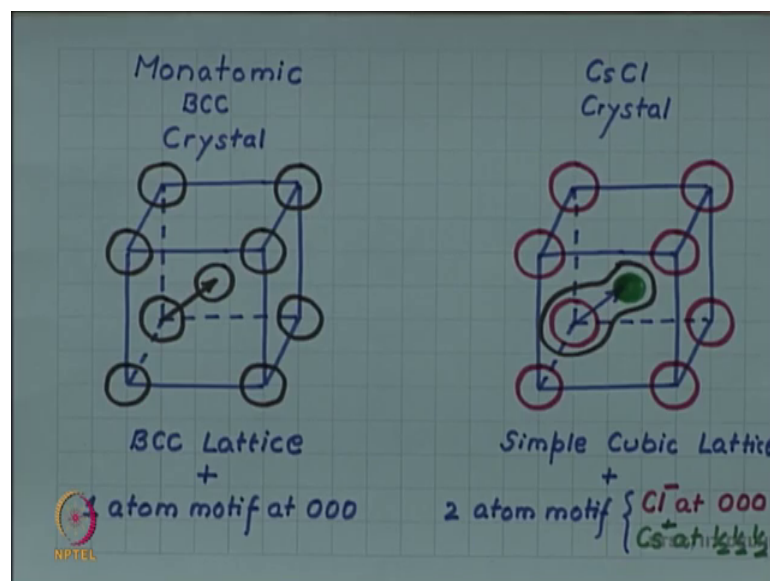


Introduction to Materials Science and Engineering
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Lecture – 35
BCC vs CsCl

There is a widespread misconception that cesium chloride structure is body centered cubic. So, I want to clarify that I have already mentioned this in the previous video.

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But I want to use this video to further clarify that confusion. So, monatomic BCC crystal means a body centered cubic lattice with one atom motif at each lattice point, that is the monatomic BCC crystal. So, this is what should if we say BCC and mean, crystal we are actually meaning body centered cubic crystal.

Otherwise BCC should actually stand for BCC lattice which does not have any atom any way, it has lattice points at the corner and an lattice point at the centered of the cube, but if we are saying mona BCC crystal or we are implying crystal by saying BCC, it should be actually a monatomic BCC crystal, when one atom sitting at each lattice point this is our BCC. But cesium chloride we have seen that has chloride ions sitting at the chloride ions sitting at the corners, but cesium ion sitting at the body centered.

So, the corner ion and the body centered ion are not equivalent, the corner point and the body centered point are not equivalent lattice points. So, the equivalent lattice points are only at the corners, this is because of the occupancy of corner and body centered by different ions. So, this is no more at lattice translation vector this is not a translational symmetry. So, this translational this was a translational symmetry or a lattice translation of monatomic BCC, but this is not a lattice translation in cesium chloride.

So, the structure changes the lattice changes instead of BCC lattice, we have a simple cubic lattice, and we will have to select 2 atoms as motif a chloride ion sitting at the lattice point, with a cesium ion shifted by half as we have seen, but in many text books, and on web, there is wide spread misconception where cesium chloride crystal is sometimes called BCC, because there is an atom in the body centered, but they all or ion in the body centered, but since that ion is not the same as the corner ion it is not body centered cubic even (Refer Time: 02:57) in his famous lectures in physics as made this mistake.