Other crystal structures:

1. Sodium chloride (NaCl) structure:

This has an fcc lattice and a basis consisting of one atom of each type. Each Na atom is surrounded by six atoms of Cl with a nearest neighbor distance of half the cube edge. Each unit cube has four units of NaCl. The positions of the atoms can be chosen as follows:

Na atoms are at ½ ½ ½ ; 00 ½ ; 0 ½ 0; ½ 00 and Cl atoms are at 000; ½ ½ 0; ½ 0 ½ ; 0 ½ ½ , as shown in figure 25.

Table 5: Some compounds with the sodium chloride structure

Crystal	$a(\mathring{A})$	**Crystal**	$a(\mathring{A})$
LiF	4.02	CsF	6.01
LiCl	5.13	AgCl	5.55
NaF	4.62	MgO	4.21
NaCl	5.64	CaO	4.81
NaBr	5.97	CaS	5.69
KF	5.35	SrSe	6.23
KCl	6.29	BaO	5.52
KBr	6.60	BaS	6.39

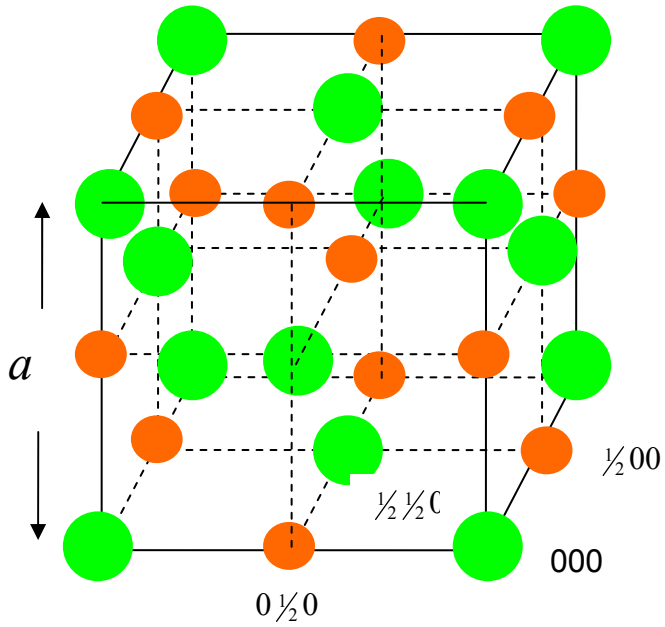

Figure 25: The NaCl structure with two interpenetrating fcc lattices of Cl atoms (green spheres) and Na atoms (orange spheres).

2. Cesium chloride structure:

This structure has a simple cubic lattice and a basis containing one atom of each type (i.e. cesium and chlorine atoms), as shown in figure 26. Each atom is at the center of a cube, with atoms of the other type at the corners, all at a distance $\frac{\sqrt{3}}{2}a$ away, so that each atom has eight of its nearest neighbors of other type. The next nearest neighbor to this atom is six and are of the same type and are each at a distance a away. There is one molecule per primitive cell with atoms at the corners 000

and body-centered positions t ½ ½ ½ of the simple cubic lattice. If the both atoms of the basis are the same, the structure may be bcc.

Table 6: Some compounds with the cesium chloride structure

Crystal	$a(\mathring{A})$	Crystal	$a(\mathring{A})$
CsCl	4.12	TlCl	3.83
CsBr	4.29	TlBr	3.97
CsI	4.57	TlI	4.20

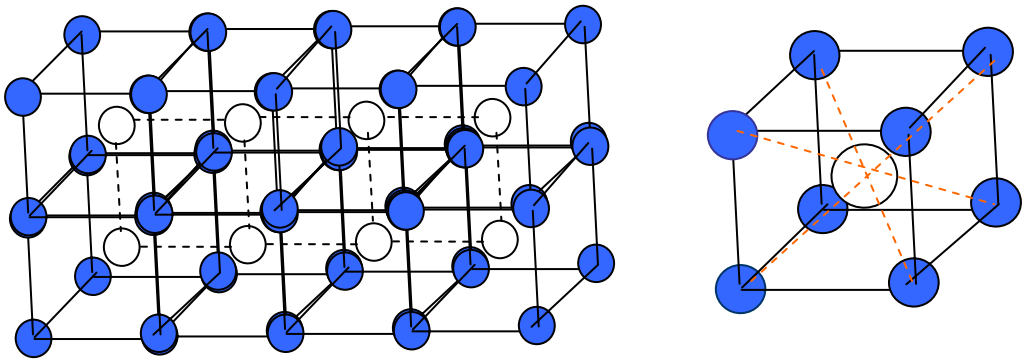

Figure 26: The cesium chloride structure. The cesium ions (solid blue spheres) and the chlorine ions (white spheres) form two interpenetrating simple cubic lattices. The basis has two ions: Cs^+ ion at 000 and Cl^- ion at ½½½ .

3. Zincblende Structure:

This structure has two interpenetrating fcc structure like diamond structure. Here the cubic zinc sulfide (called zincblende) is formed when Zn atoms are placed on one fcc lattice and S atoms on the other fcc lattice, as shown in figure 18. The conventional cell is a cube which contains four molecules of ZnS. About each atom there are four equally distant atoms of opposite type arranged at the corners of regular tetrahedron. The positions of Zn atoms are at 000; $\frac{1}{2}\ \frac{1}{2}\ 0$; $\frac{1}{2}\ 0\ \frac{1}{2}$; $0\ \frac{1}{2}\ \frac{1}{2}$, and these of S atoms are at $\frac{1}{4}\frac{1}{4}\frac{1}{4}$; $\frac{1}{4}\frac{3}{4}\frac{3}{4}$; $\frac{3}{4}\frac{1}{4}\frac{3}{4}$; $\frac{3}{4}\frac{3}{4}\frac{1}{4}$.

Table 7: Some compounds with the zincblende structure.

Crystal	$a(\overset{\circ}{A})$	**Crystal**	$a(\overset{\circ}{A})$
CuF	4.26	ZnSe	5.67
CuCl	5.41	ZnTe	6.09
SiC	4.35	CdS	5.82
ZnS	5.41	AlAs	5.66
GaP	5.45	GaAs	5.65
AgI	6.47	InP	5.87
BeSe	5.07	InSb	6.46
BeS	4.85	SiC	4.35