(b) ZnS : fcc lattice

Two different atoms : $\vec{r}_1 = (0,0,0)$ $\quad 1 \longrightarrow Zn$

$\vec{r}_2 = \frac{a}{4}(1,1,1)$ $\quad 2 \longrightarrow S$

This is just like the diamond structure with two different atoms, so we can use the results calculated in (a).

$$\Rightarrow S_G = f_1(\text{fcc}) + f_2(\text{fcc}) \cdot e^{-\frac{i\pi}{2}(v_1+v_2+v_3)}$$

(c) $NaCl$: fcc lattice

Use simple cubic as the conventional cell as in (a).

Two different atoms, each has four identical bases.

$\vec{r}_1 = (0,0,0),\ a(\frac{1}{2},\frac{1}{2},0),\ a(0,\frac{1}{2},\frac{1}{2}),\ a(\frac{1}{2},0,\frac{1}{2})$

$\vec{r}_2 = a(\frac{1}{2},0,0),\ a(1,\frac{1}{2},0),\ a(\frac{1}{2},\frac{1}{2},\frac{1}{2}),\ a(1,0,\frac{1}{2})$

$1 \longrightarrow Na$

$2 \longrightarrow Cl$

$$\Rightarrow S_G = f_1\left(1 + e^{-i\pi(v_1+v_2)} + e^{-i\pi(v_2+v_3)} + e^{-i\pi(v_1+v_3)}\right)$$

$$+ f_2 e^{-i\pi v_1}\left(1 + e^{-i\pi(v_1+v_2)} + e^{-i\pi(v_2+v_3)} + e^{-i\pi(v_1+v_3)}\right)$$