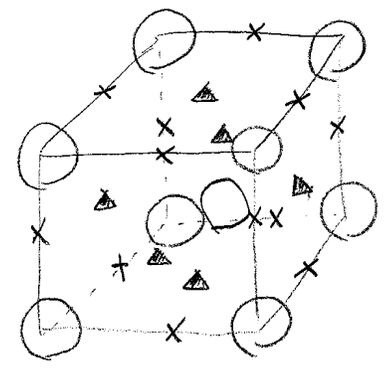2.

Radius of spheres $= \frac{\sqrt{3}}{4} a$

bcc structure

Radius of the largest sphere that

can be introduced at an interstitial site

$$= (a - 2 \times \frac{\sqrt{3}}{4} a) \times \frac{1}{2}$$

$$= (\frac{2 - \sqrt{3}}{4}) a$$

The site is located on 12 edges of the cube (as shown X)

and 6 face-centers of the cube (as shown △)

3.

(a) $NaCl$

For each Na^+ ● there is one Cl^- O, say the one along

the positive x-axis. So this is (probably) the basis. If

we consider only Na^+ ● atoms, they form a fcc lattice.

Thus :

    Bravais lattice : fcc

    Basis : 1 Na^+ ● and 1 neighboring Cl^- O

    (Different choices are possible, ex :)