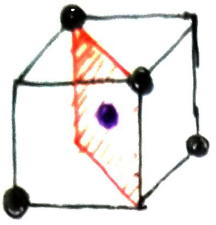
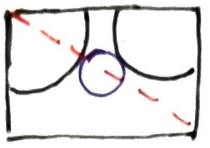
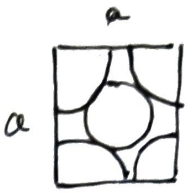
6/4

$\frac{1}{8}$ de cube :







$4r_o = \sqrt{2}\,a$

$$2r_o + 2r_{site} = \frac{\sqrt{3}}{2}a$$

$$2r_{site} = \frac{\sqrt{3}}{2}\frac{4r_o}{2} - 2r_o$$

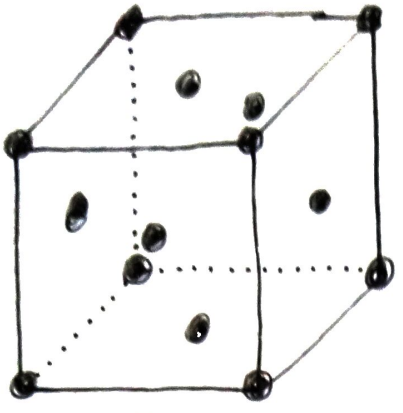
$$= r_o\left(2\frac{\sqrt{3}}{\sqrt{2}} - 2\right)$$

ie $r_{site} = r_o\left(\frac{\sqrt{3}}{\sqrt{2}} - 1\right) = 31$ pm

Or $r_{Li} = 76$ pm

Les ions O^{2-} ne sont pas tangents aux faces car $r_{Li} > r_{site}$

4.1



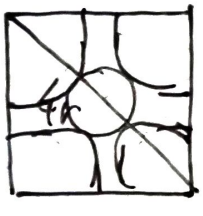
a

4.2

$$N = 8\frac{1}{8} + 6\frac{1}{2} = 4$$

$$\rho_{Cu} = \frac{NM}{N_A V_{maille}} = \frac{NM}{N_A a^3}$$

$$\Rightarrow a = \sqrt[3]{\frac{NM}{N_A \rho_{Cu}}} = \sqrt[3]{\frac{4 \cdot 65.55 \cdot 10^{-3}}{6.02 \cdot 10^{23} \cdot 8920}} = 360 \text{ pm}$$



$$4r_{Cu} = \sqrt{2}a \Rightarrow r_{Cu} = \frac{a\sqrt{2}}{4} = 128 \text{ pm}$$

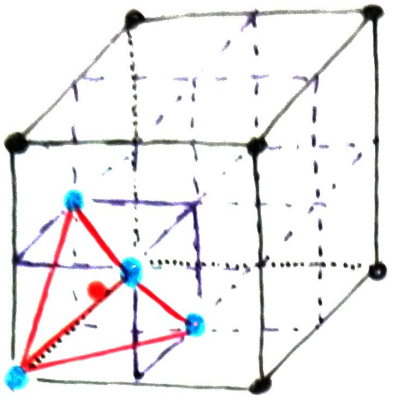
4.3

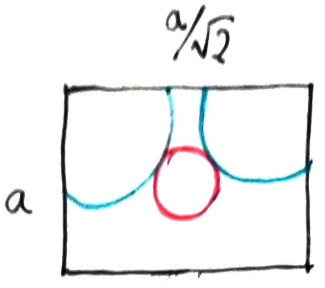
$$C = \frac{4\,\frac{4}{3}\pi r_{Cu}^3}{a^3} = \frac{4\,\frac{4}{3}\pi\left(\frac{a\sqrt{2}}{4}\right)^3}{a^3} = \frac{\pi}{3} \cdot \frac{\sqrt{2} \cdot 2}{4} = 74\,\%$$

4.4

Coordinance: 12

4.5





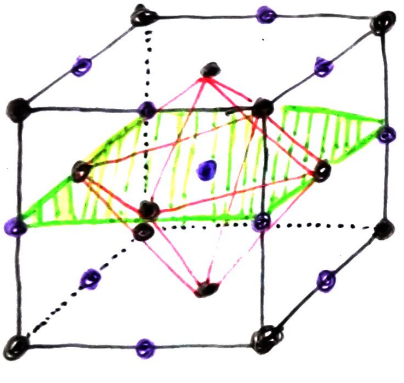
$$r_{Cu} + 2r_t + r_{Cu} = \sqrt{\left(\frac{a}{\sqrt{2}}\right)^2 + a^2} = \frac{\sqrt{3}}{2}a$$

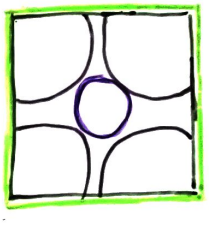
ie $2r_t = \frac{\sqrt{3}}{2}a - 2r_{Cu}$

ie $r_t = \frac{\sqrt{3}}{4}a - r_{Cu} = 29\ pm$

4.6

$$N = 1 + 12\frac{1}{4} = 4$$





$$a = 2r_{Cu} + 2r_o$$

$$\Rightarrow r_o = \frac{2r_{Cu}}{\sqrt{2}} - r_{Cu} = 53\ pm$$

Si c'était un alliage d'insertion, on aurait beaucoup plus que 30%, avec