$$d\_{\left(hkl\right)}^{\*}=h.a^{\*}+k.b^{\*}+l.c^{\*}$$

$$d\_{\left(110\right)}^{\*}=1.a^{\*}+1.b^{\*}+0.c^{\*}$$

$$d\_{(110)}=\frac{1}{d\_{(110)}^{\*}}$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}u&v&w\end{matrix}\right]\left[\begin{matrix}\frac{1}{4}&0&0\\0&\frac{1}{4}&0\\0&0&\frac{1}{4}\end{matrix}\right]\left[\begin{matrix}u\\v\\w\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}1&1&0\end{matrix}\right]\left[\begin{matrix}\frac{1}{4}&0&0\\0&\frac{1}{4}&0\\0&0&\frac{1}{4}\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}\frac{1}{4}&\frac{1}{4}&0\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\frac{1}{4}+\frac{1}{4}+0\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\frac{1}{2}\right]$$

$$\left[d\_{(110)}^{\*}\right]=\sqrt{\left[\frac{1}{2}\right]}$$

$$\left[d\_{(110)}^{\*}\right]=0,707$$

$$d\_{(110)}=\frac{1}{d\_{(110)}^{\*}}$$

$$d\_{(110)}=\frac{1}{0,707}$$

$$d\_{(110)}=1,41 Ǻ$$

$$\left[\begin{matrix}\frac{1}{a^{2}\left(\sin(β)\right)^{2}}&0&-\frac{\cos(β)}{a.c.\left(\sin(β)\right)^{2}}\\0&\frac{1}{b^{2}}&0\\-\frac{\cos(β)}{a.c.\left(\sin(β)\right)^{2}}&0&\frac{1}{a^{2}\left(\sin(β)\right)^{2}}\end{matrix}\right]$$

$$\left[\begin{matrix}\frac{1}{1^{2}\left(\sin(45)\right)^{2}}&0&-\frac{\cos(45)}{1.1.\left(\sin(45)\right)^{2}}\\0&\frac{1}{1^{2}}&0\\-\frac{\cos(45)}{1.1.\left(\sin(45)\right)^{2}}&0&\frac{1}{1^{2}\left(\sin(45)\right)^{2}}\end{matrix}\right]$$

$$\left[\begin{matrix}2&0&-1,41\\0&1&0\\-1,41&0&2\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}1&0&2\end{matrix}\right]\left[\begin{matrix}2&0&-1,41\\0&\frac{1}{1^{2}}&0\\-1,41&0&2\end{matrix}\right]\left[\begin{matrix}1\\0\\2\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}2-2,83&0&-1,45+4\end{matrix}\right]\left[\begin{matrix}1\\0\\2\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\left[\begin{matrix}-0,83&0&2,55\end{matrix}\right]\left[\begin{matrix}1\\0\\2\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=[-0,83+0+5,1]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=4,27$$

$$\left|d\_{(110)}^{\*}\right|^{1}=\sqrt{4,27}$$

$$\left|d\_{(110)}^{\*}\right|^{1}=2,066$$

$$d\_{(110)}=\frac{1}{d\_{(110)}^{\*}}$$

$$d\_{(110)}=\frac{1}{2,066}$$

$$d\_{(110)}=0,48 Ǻ$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=\left[\begin{matrix}1&1&0\end{matrix}\right]\left[\begin{matrix}\frac{1}{4}&0&0\\0&\frac{1}{4}&0\\0&0&\frac{1}{4}\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$\left|d\_{(110)}^{\*}\right|^{2}=\frac{1}{2}$$

$$\left|d\_{(110)}^{\*}\right|^{1}=\sqrt{\frac{1}{2}}$$

$$\left|d\_{(110)}^{\*}\right|^{1}=\frac{1}{\sqrt{2}}$$

$$\left|d\_{\left(100\right)}^{\*}\right|^{2}=\left[\begin{matrix}1&0&0\end{matrix}\right]\left[\begin{matrix}\frac{1}{4}&0&0\\0&\frac{1}{4}&0\\0&0&\frac{1}{4}\end{matrix}\right]\left[\begin{matrix}1\\0\\0\end{matrix}\right]$$

$$\left|d\_{(100)}^{\*}\right|^{2}=\frac{1}{4}$$

$$\left|d\_{(100)}^{\*}\right|^{1}=\sqrt{\frac{1}{4}}$$

$$\left|d\_{(100)}^{\*}\right|^{1}=\frac{1}{2}$$

$$d\_{\left(110\right)}^{\*}.d\_{\left(100\right)}^{\*}=\left[\begin{matrix}1&1&0\end{matrix}\right]\left[\begin{matrix}\frac{1}{4}&0&0\\0&\frac{1}{4}&0\\0&0&\frac{1}{4}\end{matrix}\right]\left[\begin{matrix}1\\0\\0\end{matrix}\right]$$

$$d\_{\left(110\right)}^{\*}.d\_{\left(100\right)}^{\*}=\left[\begin{matrix}\frac{1}{4}&\frac{1}{4}&0\end{matrix}\right]\left[\begin{matrix}1\\0\\0\end{matrix}\right]$$

$$d\_{\left(110\right)}^{\*}.d\_{\left(100\right)}^{\*}=[\frac{1}{4}+0+0]$$

$$d\_{\left(110\right)}^{\*}.d\_{\left(100\right)}^{\*}=\frac{1}{4}$$

$$\cos(θ=)\frac{d\_{\left(100\right)}^{\*}d\_{\left(110\right)}^{\*}}{\left|d\_{\left(110\right)}^{\*}\right|.\left|d\_{\left(100\right)}^{\*}\right|}$$

$$\cos(θ=)\frac{\frac{1}{4}}{\frac{1}{\sqrt{2}.}\frac{1}{2}}$$

$$\cos(θ=)\frac{\frac{1}{4}}{\frac{1}{2}.\frac{1}{\sqrt{2}}}=0,707$$

$$θ=45°$$

$$\left[\begin{matrix}\frac{1}{4^{2}\left(\sin(120)\right)^{2}}&0&-\frac{\cos(120)}{4.5.\left(\sin(120)\right)^{2}}\\0&\frac{1}{6^{2}}&0\\-\frac{\cos(120)}{4.5.\left(\sin(120)\right)^{2}}&0&\frac{1}{4^{2}\left(\sin(120)\right)^{2}}\end{matrix}\right]$$

$$\left[\begin{matrix}0,083&0&0,033\\0&0,02777&0\\0,033&0&0,083\end{matrix}\right]$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=\left[\begin{matrix}1&1&0\end{matrix}\right]\left[\begin{matrix}0,083&0&0,033\\0&0,02777&0\\0,033&0&0,083\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=\left[\begin{matrix}0,083&0,027&0,033\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=0,11111$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{1}=0,33333$$

$$\left|d\_{\left(201\right)}^{\*}\right|^{2}=\left[201\right]\left[\begin{matrix}0,083&0&0,033\\0&0,02777&0\\0,033&0&0,083\end{matrix}\right]\left[\begin{matrix}2\\0\\1\end{matrix}\right]$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=\left[0,2 0 0,15\right]\left[\begin{matrix}2\\0\\1\end{matrix}\right]$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{2}=0,55$$

$$\left|d\_{\left(110\right)}^{\*}\right|^{1}=0,7416$$

$$d\_{\left(201\right)}^{\*}.d\_{\left(110\right)}^{\*}=\left[201\right]\left[\begin{matrix}0,083&0&0,033\\0&0,02777&0\\0,033&0&0,083\end{matrix}\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$d\_{\left(201\right)}^{\*}.d\_{\left(110\right)}^{\*}=\left[0,2 0 0,15\right]\left[\begin{matrix}1\\1\\0\end{matrix}\right]$$

$$d\_{\left(201\right)}^{\*}.d\_{\left(110\right)}^{\*}=0,2$$

$$\cos(θ=)\frac{d\_{\left(100\right)}^{\*}d\_{\left(110\right)}^{\*}}{\left|d\_{\left(110\right)}^{\*}\right|.\left|d\_{\left(100\right)}^{\*}\right|}$$

$$\cos(θ=)\frac{0,2}{0,7416 . 0,33333}$$

$$\cos(θ=)0,8090$$

$$θ=36°$$