

Ex 2: $\lambda = 1,54 \text{ \AA}$, $R = 38,9 \text{ mm} \rightarrow 2\pi R = 240 \text{ mm}$

Qua: $\theta = \frac{L}{4R} = \frac{\pi L}{2 \cdot 2\pi R} = \frac{180L}{2 \cdot 240} = \frac{3L}{8}$

$L(\text{mm})$	θ°	$\sin \theta$	$\frac{4}{a^2} \sin^2 \theta$	N	hkl	$a^\circ \text{ \AA}$	structure
59	29,125	0,13766	0,12383	≈ 3	111	3,55 \text{ \AA}	for NiSO_4 or CaF_2
68,6	25,725	0,14340	0,13166	≈ 4	200		
101,2	37,95	0,16149	0,16353	≈ 8	220		
123,2	46,12	0,17217	0,18731	≈ 11	311		
130,2	48,825	0,17525	0,19518	≈ 12	222		
160,8	60,13	0,18686	1,2675	≈ 16	400		

$\frac{0,12383}{3} = 0,0794$

Qua: $\frac{4 \sin^2 \theta}{a^2} = \frac{N}{a^2} \rightarrow \frac{1}{a^2} = \frac{4 \sin^2 \theta}{2^2 N} = \frac{1,2675}{16} = 0,0792$

donc $a^2 = 12,62 \rightarrow a = 3,55 \text{ \AA}$

$r = \frac{\sqrt{2}a}{4} = 1,25 \text{ \AA}$

$\rho = \frac{4 \times M_w}{N_A \cdot a^3} = \frac{4 \times 58,94 \times 10^{-3}}{6,023 \times 10^{23} \times (3,55)^3 \times 10^{-30}}$

Alors: $\rho = 8,749 \times 10^3 \text{ kg/m}^3$