EXPERIMENT I

DEMONSTRATION OF X-RAY DIFFRACTION

OBJECTIVE : To observe one method of evaluating atomic crystalline structure by using x-ray diffraction. To understand the use of Bragg's Law and its relation to crystal structure.

EQUIPMENT: LIGHT SOURCE, RULER

PART I.

DIFFRACTION PEAK #	BRAGG DIFFRACTION ANGLE, θ_i	$\sin \theta_i$	$\sin^2 \theta_i$	$\dfrac{\sin^2 \theta_i}{\sin^2 \theta_1}$	Q^2	$a\ (\text{Å})$
1	19.1	0.327218	0.107072	1.000000	3	4.0758
2	22.2					
3	32.2					
4	−38.8					
5	40.85					

LATTICE PARAMETER OF MATERIAL $\quad a = \dfrac{\lambda}{2\sqrt{c}} \quad c = \dfrac{\sin^2 \theta}{Q^2}$

$a = \dfrac{z_a}{5} = \dfrac{20.3922}{5} = 4.07844$

$a = 4.07844$

Assuming that the sample is a pure substance, the element is