**LAB No. 2 X-Ray Diffraction Worksheet**

1. Explain the principle of x-ray diffraction, i.e., why do we get peaks only at certain values of 2θ and how are they related to the crystal structure.

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1. Utilize the data provided to find the following:
   1. Identify the 4 unknown scans by using the attached material data.

Assume n=1, λ = 1.54 angstroms

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| Scan 1 is |  |
| Scan 2 is |  |
| Scan 3 is |  |
| Scan 4 is |  |

* 1. Identify the crystal planes (hkl) associated with each peak.

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| Scan 1 is |  |
| Scan 2 is |  |
| Scan 3 is |  |
| Scan 4 is |  |

* 1. Identify the crystal structure.

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| --- | --- |
| Scan 1 is |  |
| Scan 2 is |  |
| Scan 3 is |  |
| Scan 4 is |  |

* 1. Calculate the lattice parameter(s) for each material using the following formulas:

Cubic Structure



Hexagonal Structure

given 

|  |  |
| --- | --- |
| Scan 1 is |  |
| Scan 2 is |  |
| Scan 3 is |  |
| Scan 4 is |  |

1. Explain why a light microscope cannot provide clear images at very high magnification (>1500x)? On the other hand, why does XRD have such high resolution?

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