*Heaven’s light is our guide.*

****Rajshahi University of Engineering and Technology**

**

**Department of Electrical & Electronic Engineering**

**Course no.** EEE 4166

**Course title:** Processing & Fabrication Technology Sessional

**Experiment no.** 5

**Experiment name:** Characterization of ZnO thin lim from XRD analysis and UV/Vis spectrophotometer

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**Data table 5.1:** XRD data for film thickness calculation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sl. No.** | **2\*Theta** | **Intensity** |  | **Sl. No.** | **2\*Theta** | **Intensity** |
| 1 | 20 | 20 |  | 101 | 21.98 | 14 |
| 2 | 20.02 | 18 |  | 102 | 22 | 14 |
| 3 | 20.04 | 18 |  | 103 | 22.02 | 22 |
| 4 | 20.06 | 20 |  | 104 | 22.04 | 14 |
| 5 | 20.08 | 12 |  | 105 | 22.06 | 14 |
| …….. | …….. | …….. |  | …….. | …….. | …….. |
| …….. | …….. | …….. |  | …….. | …….. | …….. |
| 99 | 21.94 | 12 |  | 3499 | 89.98 | 18 |
| 100 | 21.96 | 12 |  | 3500 | 90 | 18 |

**Fig. 5.1:** Intensity VS 2\*theta graph from XRD data for film thickness analysis

**Data table 5.2:** UV/Vis data for band gap calculation

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **wave** | **%Trans.** | **Trans.** | **log term** | **alpha** | **hv** | **(αhv)^.5** | **(αhv)^2** |
| 900 | 54.51 | 0.5451 | 2.263524 | 5212895 | 1.377778 | 2679.964809 | 13633787.91 |
| 899 | 54.474 | 0.54474 | 2.263811 | 5213556 | 1.37931 | 2681.62486 | 13681068.99 |
| 898 | 52.986 | 0.52986 | 2.275839 | 5241257 | 1.380846 | 2690.236112 | 13799758.72 |
| …….. | …….. | …….. | …….. | …….. | …….. | …….. | …….. |
| …….. | …….. | …….. | …….. | …….. | …….. | …….. | …….. |
| 894 | 54.391 | 0.54391 | 2.264473 | 5215081 | 1.387025 | 2689.506644 | 13915972.94 |
| 893 | 54.342 | 0.54342 | 2.264864 | 5215983 | 1.388578 | 2691.244672 | 13965189.03 |

**Fig. 5.2:** hv vs (αhv)^2 graph from UV/Vis data for direct band gap analysis

**Fig. 5.3:** hv vs (αhv)^0.5 graph from UV/Vis data for indirect band gap analysis