

MS13-1-14 Synthesis of α - MoO_3 nanofibres for enhanced field-emission properties

#MS13-1-14

S.K.S. Patel¹¹Department of Chemistry, MMV, Banaras Hindu University - Varanasi-221005 (India)**Abstract**

One-dimensional α - MoO_3 nanofibres of 280–320 nm diameters were synthesized by a hydrothermal method. The morphologies and compositions of as-synthesized α - MoO_3 nanofibres have been characterized by X-ray powder diffraction, Raman spectroscopy, and field-emission scanning electron microscopy. X-ray photoelectron spectroscopy showed the predominantly 6+ oxidation state with a small percentage of reduced δ^+ ($5 < \delta < 6$) oxidation state. The field-emission properties of α - MoO_3 nanofibres show a lower turn-on electric field of $2.48 \text{ V } \mu\text{m}^{-1}$ and threshold electric field of $3.10 \text{ V } \mu\text{m}^{-1}$. The results suggest that the α - MoO_3 nanofibres are promising candidate for efficient and high performance field-emission devices.

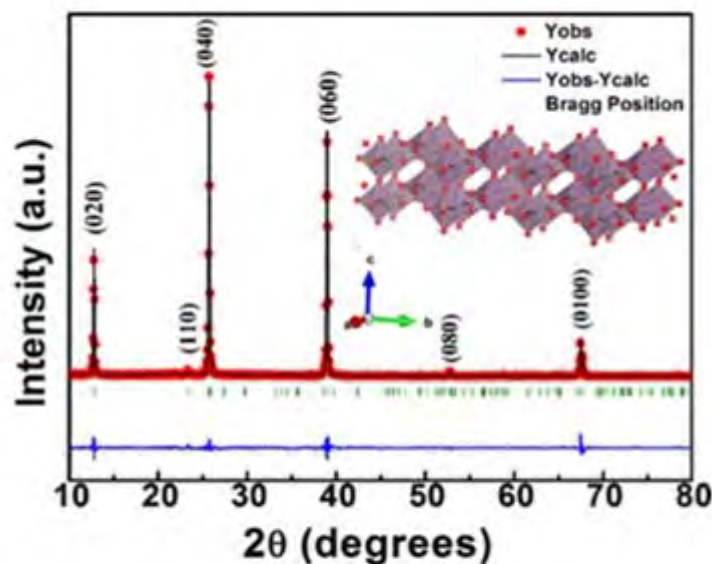


Fig. 1. Rietveld analysis of XRD data using orthorhombic structure with space group $Pbnm$ of α - MoO_3 nanofibers and the insert shows the unit cell crystal structure.