

Morphological evolution, Structural and Optical Investigations of ZnO:Mg (Mg_xZn_{1-x}O (0 ≤ x ≤ 30 %)) nanostructures

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Electronic Supplementary Information:

(ESI) 1: EDAX analysis of pure and Mg doped ZnO

The energy-dispersive X-ray spectroscopy (EDAX) spectrum of Mg free (or pristine) sample is shown in Fig. ESI 1 (a)) which reveals the only Zn and O signals. The approximate atomic ratio of Zn and O is found to be 51.05:48.95, which is in consistent with the stoichiometry of ZnO. The EDAX spectrum of 5 % doped Mg: ZnO sample exhibits the Zn, O and Mg signal peaks and the approximate atomic ratio is found to be Zn/O/Mg ≈ 45.86/49.77/4.50. This is consistent with the stoichiometry of ~5 at % doped Mg in ZnO (Fig ESI 1 (b)). Since the solubility of Mg in ZnO is limited to about 5 at%, alternatively it could be 5% Mg doped ZnO+Mg. Since Mg is in small amount XRD could not be detected any reflections peaks corresponding to it. EDAX spectrum indicates that the as-prepared pure and 20 % Mg doped ZnO (Fig. ESI 1 (c)) product is in pure phase with an approximate stoichiometry of 35.94:45.54:18.52, which shows nearly 20 at.% doping of Mg in the system. The EDAX spectrum of the 30 at % Mg doped ZnO (Fig ESI 1 (d)) reveals the atomic ratio of the elements: Zn/O/Mg ≈ 26.54/45.44/28.02. Compositional analysis using EDAX was performed for all the samples and is in very good agreement indicating nominal doping level and atomic percentage of Zn, O and Mg.

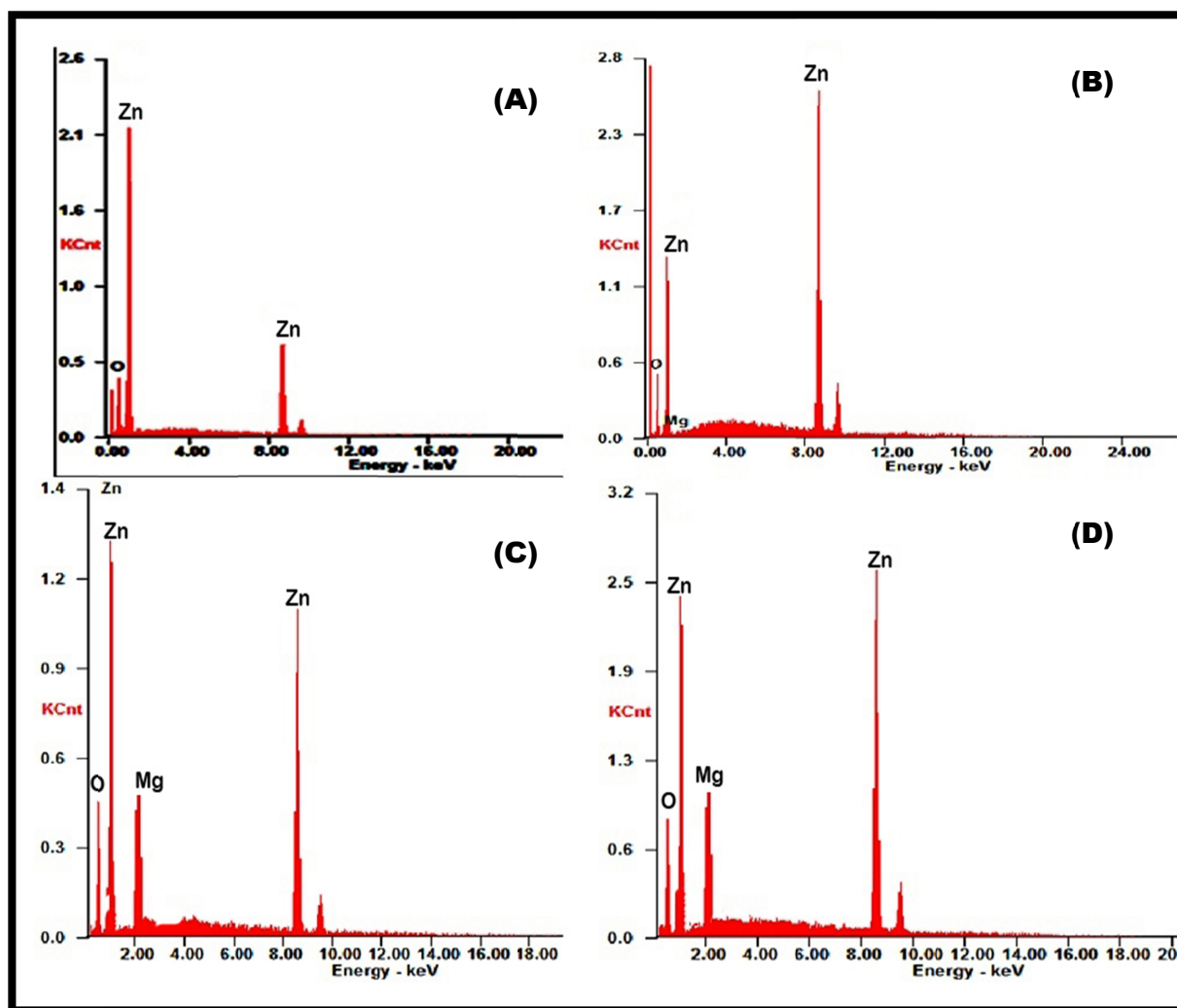


Figure ESI-1. The energy-dispersive X-ray spectroscopy (EDAX) spectrum of (A) pure ZnO hexagonal nanoplate, (B) 5% Mg doped ZnO and (C-D) 20 and 30 % Mg doped ZnO nanostructures.