SYNTHESIS AND PHOTOLUMINESCENCE PROPERTIES OF LAYERED DOUBLE HYDROXIDES CONTAINING LANTHANIDES

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Abstract - Layered double hydroxides (LDHs) also known as a anionic clays or hydrotalcite-like compounds have triggered huge research interest attention in the last few years. Interest in LDHs arises from their unique properties such as flexible modular structure, rich intercalation chemistry, uniform distribution of metal cations in the layer and weak interlayer interactions as a result they offer incredible opportunity for the development of advanced functional materials. Their unique properties have been employed for applications in energy storage, catalysis, adsorption, separation, sensors, drug delivery and novel composites. LDHs are represented by the general formula of [M2+1-xM3+x(OH)2](An-)x/n•yH2O, where M2+ and M3+ represent divalent and trivalent metal ions, respectively; x is equal to the ratio M3+/ (M2++M3+) and An- is the interlayer anion of valence n. However the synthesis of lanthanide incorporated LDH faces major challenges. Therefore, new strategies and techniques needs to be developed for the synthesis and fabrication of lanthanide incorporated LDH. In the present work, successful synthesis of lanthanide incorporated ternary layered double hydroxide have been carried out and due to the presence of the lanthanide in the lattice these compounds are light emitting and magnetic in nature, therefore attracting applications involving these two properties. The details of the synthesis along with interesting spectroscopic properties will be discussed.

Keywords: Layered Double Hydroxides, Lanthanides, Functional, Magnetic, Catalysis

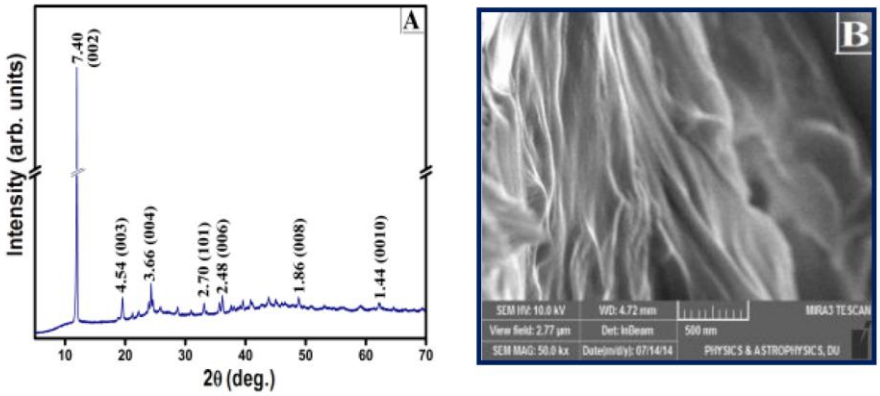


Fig. PXRD pattern (A) and SEM image(B) of Zn-La-Er LDH

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