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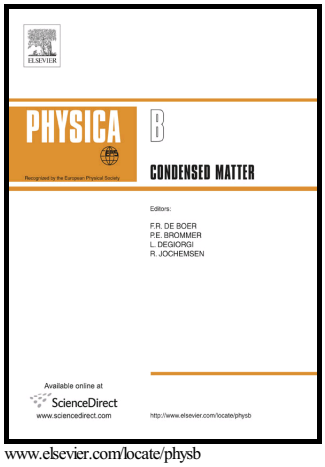

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Influence of ammonium hydroxide solution on $LiMn_2O_4$ nanostructures prepared by modified chemical bath method

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Abstract

$LiMn_2O_4$ (LMO) powders were prepared by modified chemical bath deposition (CBD) method by varying ammonium hydroxide solution (AHS). The volume of the AHS was varied from 5 – 120 mL in order to determine the optimum volume that is needed for preparation of LMO powders. The effect of AHS volume on the structure, morphology, and electrochemical properties of LMO powders was investigated. The X-ray diffraction (XRD) patterns of the LMO powders correspond to the cubic spinel LMO phase. It was found that the XRD peaks increased in intensity with increasing volume of the AHS up to 20 mL. The estimated average grain sizes calculated using the XRD patterns were found to be in the order of 66 ± 1 nm. It was observed that the estimated average grain sizes increased up to 20 mL of AHS. The scanning electron microscopy (SEM) results revealed that the AHS volume does not influence the surface morphology of the prepared nano-powders. Elemental energy dispersive (EDS) analysis mapping conducted on the samples revealed homogeneous