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978-93-5996-539-0

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PROCEEDINGS OF THE ICSSR SPONSORED TWO DAY NATIONAL SEMINAR

OCT
2023

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Indian Council of Social Science Research, New Delhi - sponsored

Two-day National Seminar on

Revealing Next-Generation Materials to Empower Green Hydrogen for Energy & Environmental Applications: Pioneering the National Hydrogen Initiative

12th & 13th October 2023

Organised by

DEPARTMENT OF PHYSICS
SRI S. RAMASAMY NAIDU MEMORIAL COLLEGE
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LIST OF ABSTRACTS

Electrochemical Performance of Hydrothermally Synthesized Double Perovskite La_2NiMnO_6

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Recently, double perovskite materials have been widely explored by researchers due to their tunable properties and emerging new applications. Mainly, La_2NiMnO_6 double perovskite has received attention because of its outstanding electrical, magnetical and magneto-dielectric properties. The present work unveils the electrochemical properties of hydrothermally synthesized La_2NiMnO_6 (LNMO) double perovskite as an electrode material for energy storage applications. The powder X-ray diffraction analysis of the prepared La_2NiMnO_6 confirms the monoclinic structure with the $P2_1/n$ space group. Scanning Electron Microscopy shows the formation of agglomerated grains with few cubes and elemental analysis (EDAX) confirms the presence of all the elements in appropriate proportion for the formation of LNMO without any impurities. The pseudocapacitive nature of synthesized LNMO is observed via Cyclic Voltammetry and the yielded highest specific capacitance is 95.26 F/g at a scan rate of 20mV/s.

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1. INTRODUCTION

Over the past few years technologies that are used commercially are commercially increasing the global demand for electric power [1]. Supercapacitor is one of the promising electrochemical energy storage devices because it can store 10 to 100 times per unit volume than capacitors can accept and deliver charge much faster than batteries, and can tolerate many more charge/discharge cycles than rechargeable batteries [2].

In the last few years, double perovskite gained interest as a result of their various technology applications. Double perovskite structure is derived from single perovskite structure, with the general formula $A_2B_2O_6$ (where A is an alkaline earth cation which coordinates with twelve oxygen anions and is larger in size and B is the transition metal cation which coordinates with six oxygen anions and is smaller in size). The double perovskite