Accepted Manuscript

Facile synthesis and electrochemical performance of Mg-substituted $Ni_{1-x}Mg_xCo_2O_4$ mesoporous nanoflakes for energy storage applications

Meenu Sharma, Shashank Sundriyal, Amrish K. Panwar, Anurag Gaur

PII:	S0013-4686(18)32324-7
DOI:	10.1016/j.electacta.2018.10.085
Reference:	EA 32882
To appear in:	*Electrochimica Acta*
Received Date:	21 February 2018
Accepted Date:	13 October 2018

Please cite this article as: Meenu Sharma, Shashank Sundriyal, Amrish K. Panwar, Anurag Gaur, Facile synthesis and electrochemical performance of Mg-substituted $Ni_{1-x}Mg_xCo_2O_4$ mesoporous nanoflakes for energy storage applications, *Electrochimica Acta* (2018), doi: 10.1016/j.electacta.2018.10.085

Facile synthesis and electrochemical performance of Mg-substituted $Ni_{1-x}Mg_xCo_2O_4$ mesoporous nanoflakes for energy storage applications

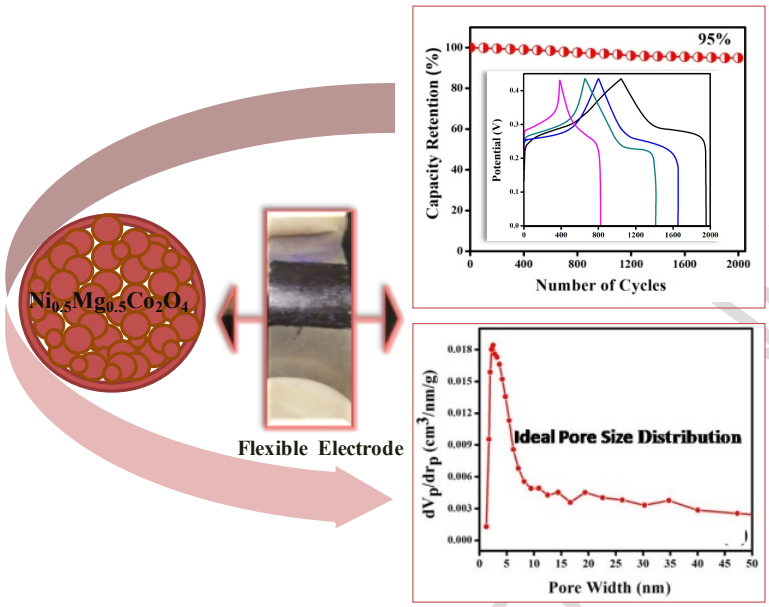
Meenu Sharma[1], Shashank Sundriyal[2], Amrish K. Panwar[3], Anurag Gaur[1*]

[1]Department of Physics, National Institute of Technology, Kurukshetra 136119, India

[2]CSIR-Central Scientific Instrument Organisation (CSIR-CSIO), Chandigarh-160030, India

[3]Department of Applied Physics, Delhi Technological University, New Delhi-110042, India

GRAPHICAL ABSTRACT



ABSTRACT

The specific surface area and pore size of illustrative electrode material is a promising task to achieve better performance of energy storage devices. In this respect, Mg-substituted $Ni_{1-x}Mg_xCo_2O_4$ (x=0.0, 0.1, 0.2, 0.3, 0.4, 0.5) samples were synthesized by cost-effective and facile hydrothermal method. As-prepared samples were evaluated as the electrode material for a battery application. The structural and electrochemical characterization analysis has been carried out systematically. Among different samples, NMC50 (x=0.5) exhibit highest BET surface area of 61 m^2g^{-1} with a suitable pore volume of 0.3029 cm^3g^{-1} and narrow pore size distribution of 2−10 nm. It is verified that the special features of the NMC50 including uniformity of the surface texture and porosity bring significant effect on the electrochemical performances. Consequently, the excellent specific capacity of 302 $mAhg^{-1}$ is observed for NMC50 sample at a current density of 1.1 Ag^{-1} and a remarkable cyclic stability of ~95% is maintained over 2000 continuous charge-discharge cycles. The improved electrochemical performance of NMC50, undoubtedly makes it worth as an excellent electrode material for high-performance energy storage applications.