Solid State Sciences
Volume 119, September 2021, 106693

Characterization of Dy_2S_3 thin films deposited by successive ionic layer adsorption and reaction (SILAR) method

P.P. Bagwade [a], D.B. Malavekar [a], S.B. Ubale [a], T.T. Ghogare [a], R.N. Bulakhe [b], I. In [b c], U.M. Patil [a], C.D. Lokhande [a]

Show more

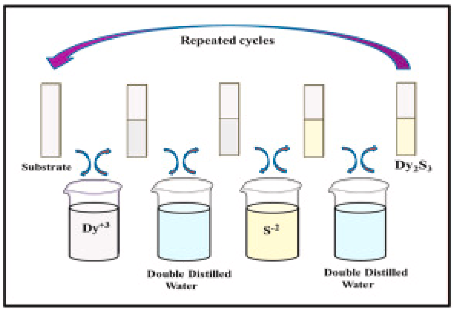
Share Cite

https://doi.org/10.1016/j.solidstatesciences.2021.106693
Get rights and content

Abstract

The successive ionic layer adsorption and reaction (SILAR) method was used for the deposition of dysprosium sulfide (Dy_2S_3) thin films on stainless steel (SS) substrate. The X-ray diffraction (XRD) study showed orthorhombic crystal structure of Dy_2S_3. Scanning electron microscopic study revealed microstructure with randomly distributed spherical nanostructured particles. The films exhibited hydrophilic nature with a contact angle of 50° and a specific surface area of 48 m^2g^{-1}. The electrochemical properties of Dy_2S_3 films in 1 M Na_2SO_4 electrolyte displayed maximum specific capacitance (C_s) of 273 Fg^{-1} at a scan rate of 5 mVs^{-1}.

Graphical abstract



Download : Download high-res image (196KB)
Download : Download full-size image

Introduction

Increasing energy demands contrasted with diminishing non-renewable energy sources invites a considerable intensification of efforts to develop environment-friendly energy storage devices. The growing need for batteries, supercapacitors, and fuel cells becomes more pronounced [1,2]. Energy storage systems consisting of batteries have low life cycles and need larger space for system [3]. On the other hand, supercapacitors (SCs) with remarkable