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Electrochemical behavior of hydrothermally synthesized porous groundnuts-like samarium oxide thin films

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Abstract

One pot hydrothermal method is used for synthesis of groundnuts-like samarium oxide (Sm_2O_3) thin film on stainless steel substrate. The Sm_2O_3 film is characterized by X-ray diffraction, water contact angle, UV–visible spectrophotometer, photoluminescence, and field emission scanning electron microscopy techniques. The hydrothermal method allows the formation of cubic Sm_2O_3 film with porous groundnuts-like morphology. The Sm_2O_3 film is hydrophilic with the optical band gap of 3.70 eV. Electrochemical capacitive behavior of Sm_2O_3 film is studied using cyclic voltammetry, galvanostatic charge–discharge measurement and electrochemical impedance spectroscopy. The Sm_2O_3 film