

## The perovskite $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$ -MWCNT modified glassy carbon electrode – Its Characterization and Capacity in Oxygen Reduction Reaction

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The modified glassy carbon electrodes (GCE) are prepared by chemical deposition of  $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$  (BSCF), multi-walled carbon nanotube (MWCNT) and BSCF-MWCNT. The GCE, BSCF/GCE, MWCNT/GCE and BSCF-MWCNT/GCE electrodes are characterised by scanning electron microscopy (SEM), atomic force microscopy (AFM), cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS). The surface morphology studies show that MWCNT is homogeneously dispersed on the surface of BSCF. The  $\text{N}_2$  isotherm study indicates that surface area is improved by three fold than the BSCF alone. The EIS and CV show that the presence of MWCNT is significant in enhancing the electronic conductivity as well as kinetics. The reduction behaviours of these electrodes in 0.1 M KOH are compared using chronoamperometry, CV and hydrodynamic voltammetry. The BSCF-MWCNT/GCE shows a pronounced electrocatalytic activity towards oxygen reduction.

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**Keywords:**  $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_3$  (BSCF), multiwall carbon nanotube (MWCNT), oxygen reduction reaction (ORR)

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