# Characterization and synthesis of nanocomposite thin films of α-$Fe_2O_3$ (nanoparticles) and Nafion (polymer) for bio-sensing applications

Indra Sulania [1*], Lakshmi GBVS [2] and A. Tripathi [1]

[1] Inter University Accelerator Centre, New Delhi, Delhi, India.
[2] Special Center for Nanoscience, JNU, New Delhi, India.
*Corresponding author email: indra.sulaniya@gmail.com

**Abstract:** Nanocomposite materials are multiphase solid materials which have two or more component materials, with different physical and chemical properties, blended together to form a new material with unique properties which make them good candidates for numerous applications. In this study, we have fabricated thin films of Nafion (polymer) andlectrode of Nafion and $Fe_2O_3$/CHOx/ITO was developed by drop casting method on ITO glass substrate. Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM) reveals the formation of nanorods in the films. The cyclic voltammetry studies revealed the sensing properties of the films towards the cholesterol. All the measurements were performed at IUAC, New Delhi. The electrodes show selectivity towards common interfering agents in blood serum. We observed that the nanocomposite of Nafion and $Fe_2O_3$ /CHOx/ITO based bioelectrode show good electrochemical performance for cholesterol detection with appropriate selectivity towards Cholesterol enzyme.

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