DEVELOPMENT OF NANO-COMPOSTE BASED MATERIALS FOR APPLICATION IN SOLID OXIDE FUEL CELL (SOFC) APPLICATION

Integration of hybrid nanocomposite materials in a solid oxide fuel cell (SOFC) provides excellent improved properties such as electrical conductivity and thermal stability. Similarly, the synergetic effect of materials used in nanocomposite membranes gives suppression of fuel crossover with reduced cost of operation. Currently available materials comprising of various metal oxides display their moderate characteristics in SOFC applications. In this research work, we propose to synthesize set of metal oxide based nanocomposite materials using wet chemical synthesis routes. The synthesis materials will be characterized systematically using different techniques, such as, XRD, FTIR, particle size analysis, surface area measurements, SEM, EDAX TEM and AFM measurements. Their electrical properties will be studied by high temperature impedance measurements. Based on the results, suitable alternate anode, cathode and electrolyte materials will be proposed for application in solid oxide fuel cell (SOFC) application.