

ABSTRACT NO.: 571**TITLE:** Development of Quasi-Solid State Electrolytes based on PTFE PPA and TiO_2 Ternary System for Fuel Cell Applications.**AUTHOR:** Aziza Ali (807000800)**SUPERVISOR:** Dr. Harinder Pal Singh Missan

Fossil fuels have played a crucial role in satisfying the world's global energy demands. Nevertheless, fossil fuels are a non-renewable energy source with limited reserves. Their consumption has unfortunately led to greater emissions in the atmosphere, which contributes to the enhanced Greenhouse effect. These facts have peaked interest in finding clean, sustainable, alternative energy sources. Fuel Cell technology is a viable means of sustainable energy, which provides zero-emissions, high efficiency and a wide range of applications. Presently, Nafion® membranes have monopolized the role of polymer electrolytes in fuel cells. Thus, it is imperative that new and alternative fuel cell membranes be developed, so as to reduce costs and improve existing performance. In this project study, new quasi-solid state electrolyte membranes have been synthesized using an acid-base ternary system, of Polytetrafluoroethylene (PTFE) with Polyphosphoric Acid (PPA) and Titanium dioxide. The ternary electrolyte membranes have been characterized using XRD, SEM, FTIR, IEC and Impedance Spectroscopy studies.