

ABSTRACT NO.: 543**TITLE:** Development of Poly-benzimidazole Based Nanocomposite Polymer Electrolyte Membranes.**AUTHORS:** Aryana Badali**SUPERVISOR:** Dr. Harinder Pal Singh Missan

The need for alternative sources of energy has resulted in an increased interest in the development of fuel cells. In order to make fuel cells commercially viable, the cost of them should be brought down. One way of achieving this is to replace the Nafion® electrolyte membrane as it constitutes 80% of the total cost. Thus the development of the cost effective and high performance polymer membranes for use in fuel cells is of great importance. In the present project Poly(benzimidazole) (PBI) based nanocomposite polymer electrolyte membrane has been developed using Acid-base blend approach. PBI is synthesized in the lab and its formation is confirmed. Acid functionalized nanotubular titania has also been synthesized and confirmed. The acid-base blend nanocomposite membranes has been prepared using PBI as an acid and phosphonated nanotubular titania as a base. Membranes have been formed using solution casting technique and are then characterized for various morphological, electrical and thermal properties.