ABSTRACT NO.: 544

TITLE: **Nano-composite Blend Membranes based on Phosphonated Titanium Nanotubes for Fuel Cells.**

AUTHORS: **Kathryn Imbert**

SUPERVISOR: **Dr. Harinder Pal Singh Missan**

With the growing demand for alternative sources of energy there has been an increase in the amount of research being conducted in the field of fuel cells and their materials. This study is aimed at optimizing the acid functionalization process of titania nanotubes and to understand how the acid functionalized nanotubes affect the properties of acid-base blend electrolyte membranes when blended with a base polymer. The functionalization of these nanotubes was verified using NMR and XRD spectroscopy. In order to study that nano-composite blend membranes based on phosphonated titanium nanotubes has been developed using a combination of two polymers PVIm and PVdF-HFP blended with functionalized nanotubes. The nanocomposite blend membranes has then been characterized using SEM, XRD, Impedance spectroscopy and IEC measurements and the results are then compared with membranes synthesized using unfunctionalized nanotubular titania.