

TITLE: PEO Based Polymer Electrolytes for Lithium Batteries

AUTHORS: Avril Sooklal

SUPERVISOR: Dr. H. Missan



Lithium batteries are a type of rechargeable batteries that have their chemical reactions reversed by supplying electrical energy to the cell. Varying percentages (1%-9%) of LiCF_3SO_3 (lithium triflate) were dissolved in a small volume of methanol. 500mg of PEO (poly(ethylene oxide)) was added to each of each of these solutions. The mixture was continuously stirred using magnetic beads and heat was applied at a temperature of 65°C until the mixture formed a clear gel. The gel was poured into petri dishes and placed in an oven to accelerate evaporation and hence form electrolytes. The electrolytes were removed from the petri dishes and tested using conductivity (σ), differential scanning calorimetry (DSC), for measuring thermal transitions, thermogravimetric analysis (TGA), for measuring change in weight with temperature, and x-ray diffraction (XRD) for revealing crystallography. The results obtained were compared with values for known electrolytes to see if they are feasible for use in lithium batteries.