



## Abstract

The sulphonation of polystyrene butadiene copolymer was carried with concentrated sulphuric acid and chlorosulphonic acid as sulphonating agents. SPSBR proton exchange membranes were differentiated by the methanol and water uptake, proton conductance, and thermal stability etc. Results showed that the membrane prepared in chlorosulphonic acid showed better methanol and water uptake, degree of sulphonation (DS), proton conductance and thermal stability. The developed membranes were tested using the basic electrolysis process. The obtained results revealed that the utilization of  $\text{ClSO}_3\text{H}$  acid resulted in higher performance of the membrane compared to concentrated  $\text{H}_2\text{SO}_4$ . The chlorosulphonated proton exchange membrane produced a highest power of  $9 \text{ mW/cm}^2$ , while the membrane prepared by concentrated  $\text{H}_2\text{SO}_4$  provided  $6 \text{ mW/cm}^2$  power density.