

Gelatin and DNA-based ionic conducting membranes

A. Firmino, A. Pawlicka*

IQSC, Universidade de São Paulo, C.P. 780, CEP 13560-970, São Carlos-SP, Brazil

Gelatin and DNA are abundant natural products with very good biodegradation properties and can be used to obtain acetic acid or LiClO₄-based gel polymer electrolytes (GPEs) with high ionic conductivity and good stability. The membranes were analyzed by X-ray diffraction measurements, UV-VIS-NIR spectroscopy, scanning electron microscopy (SEM) and impedance spectroscopy. The ionic conductivity results at room temperature were in the range of 10⁻⁴-10⁻⁵ S/cm and as a function of temperature obeys predominantly an Arrhenius relationship and the samples are stable up to 160°C. Good conductivity results combined with transparency and good adhesion to the electrodes have shown that gelatin and DNA-based GPEs are very promising materials to be used as solid electrolytes in electrochromic devices.