

# AC Impedance and Dielectric Spectroscopic Studies of Proton Conducting PVAc- PVdF Blended Polymer Electrolytes

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## **Abstract**

Proton conducting polymer electrolytes attracted considerable attention due to the possibility of their application in a variety of electrochemical devices, such as fuel cells, humidity and gas sensors and electrochromic displays. The blended proton conducting polymer electrolytes comprising poly(vinyl acetate) (PVAc) and poly(vinylidene fluoride) (PVdF) have been prepared for different ammonium thiocyanate (NH<sub>4</sub>SCN) ratio by solution casting technique. The formation of blend polymer - salt complex has been confirmed by FT-IR spectral studies. The ac conductivity and dielectric spectroscopy studies are carried out on the blended polymer matrix to reveal the H<sup>+</sup> conductivity. The high frequency semicircle in the impedance plot observed is due to the bulk effect of the polymer electrolytes. The proton conductivity of the blended polymer complexes increases in the order of 10<sup>-7</sup> Scm<sup>-1</sup> to 10<sup>-4</sup> Scm<sup>-1</sup> with the increase in salt concentration. The ionic transferance number of mobile ions has been estimated by Wagner's polarization method and is found to be tion 0.97 for all the samples. The dielectric spectral studies show the low frequency dispersion which implies the space charge effects arising from the electrodes.