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**Title** : Conductivity and dielectric behaviour studies of starch/PEO plus x wt-% NH<sub>4</sub>NO<sub>3</sub> polymer electrolyte

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**Abstract** : Polymer blending is used to overcome the disadvantage of pure starch film, and in the present study, starch has been blended with poly(ethylene oxide) (PEO). The X-ray diffraction study shows that starch/PEO with a ratio of 7 : 3 exhibits the least amount of crystallinity, and this was chosen in the preparation of polymer electrolyte. Films of starch/PEO blends were then prepared via solution casting technique, and their properties with different amounts of ammonium nitrate NH<sub>4</sub>NO<sub>3</sub> were compared. The highest conductivity at room temperature of similar to  $2.81 \pm 0.46 \times 10^{-7}$  S cm<sup>-1</sup> was achieved with the addition of 35 wt-% NH<sub>4</sub>NO<sub>3</sub>. Dielectric data were analysed using complex permittivity and complex electrical modulus for the sample with the highest ionic conductivity. The relaxation time tau for these samples was determined, and the plot shows that tau decreases with conductivity of the complexes. The presence of peaks in the imaginary plots shows that the starch/PEO electrolyte system is an ionic conductor.

**Subject** : Starch; PEO; Conductivity; Dielectric; Polymer Blending

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