E2-04: Some structural and conductivity studies of a novel solid electrolyte

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The structure and conductivity of a fast ionic conductor with mixed ion carriers were investigated. The starting materials were $Al(NO_3)_3$, $Mg(NO_3)_2$ and NaOH. The conductivity of the synthesised final product gradually increased with temperature up to 350°C and also the conductivity was found to depend on the molar ratio of the starting materials. In this case, the conductivity was $4.25 \times 10^{-3} \Omega^{-1} cm^{-1}$ at 350°C. The conductivity was measured using AC complex impedance technique.

Structural investigations were carried out using X-ray powder diffraction analysis and differential thermal analysis. The X- ray powder diffraction studies revealed that the conducting phase consists of $NaNO_3$ adsorbed on to the clay and DTA studies have confirmed this.

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