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SUM

**SYNTHESIS AND CHARACTERIZATION OF LISICON TYPE IONIC
AND MIXED CONDUCTORS, BASED ON Li_4XO_4 : X=Si, Ti, Ge**

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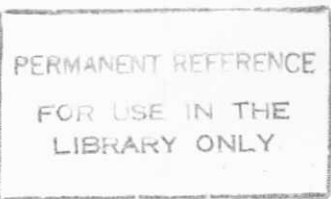
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SYNTHESIS AND CHARACTERIZATION OF LISICON TYPE IONIC AND

MIXED CONDUCTORS BASED ON Li_4XO_4 : X=Si, Ti, Ge

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In this study, the electrical conductivity of the $\text{Na}_2\text{SO}_4\text{-Na}_2(\text{W},\text{Mo})\text{O}_4$, $\text{Li}_4(\text{Si},\text{Ti})\text{O}_4\text{-Li}_3\text{CrO}_4$ and $\text{Li}_4\text{GeO}_4\text{-Li}_2(\text{Co},\text{Mg})\text{GeO}_4$ systems have been studied using complex impedance technique. New solid solutions with LISICON type structure have been found in the $\text{Li}_4(\text{Si},\text{Ti})\text{O}_4\text{-Li}_3\text{CrO}_4$ and $\text{Li}_4\text{GeO}_4\text{-Li}_2\text{CoGeO}_4$ systems. These solid solutions exhibit mixed conducting behaviour but with variation of composition, the level of electronic conductivity changes. These are the first materials in the LISICON family to show mixed ionic/electronic conduction.

Further, we have proposed a new qualitative method, the DC polarisation method, for investigating transference numbers in mixed Li^+/e^- conductors. DC polarisation measurements are made using pelleted samples with gold electrodes and the amount of charge stored as a consequence of electrochemical decomposition of the pellet is estimated. Schottky barrier impedances at the sample-electrode interface are also investigated by ac impedance and varying the nature of the electrode materials for the $\text{Li}_4\text{SiO}_4\text{-Li}_3\text{CrO}_4$ system.