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بالرسالة صفحات
لم ترد بالأصل

NUCLEAR MAGNETIC RESONANCE STUDY
OF LITHIUM SULPHATE BASED SOLID
ELECTROLYTES

A Thesis

Submitted to the Faculty of Science

Ain Shams University

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BY

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of Lithium Sulphate Based Solid
Electrolytes**

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ABSTRACT

Nour, Mohamed Abdel Aziz, on Nuclear magnetic Resonance study of lithium sulphate based solid Electrolytes. Unpublished Doctor of Philosophy dissertation, University of Ain shams, Abassia, Egypt.

The main purpose of this dissertation is for pulsed nuclear magnetic resonance study and investigation of lithium sulphate and its solid solutions which exhibit fast ion conductivities. In the monoclinic phase Lithium sulphate "Anhydrous" has been studied using NMR technique. The spin lattice and spin-spin relaxation times has been measured at different temperatures between 298K and 825 K at frequencies 12.37 and 21 MHz

In the cubic phase measurements of the spin lattice relaxation time has been made from the transition temperature to the melting point. It was impossible to measure the spin-spin relaxation time for the cubic phase

Assuming that paramagnetic relaxation is irrelevant in the sample, the strong relaxation which is stronger than that caused by dipolar interaction, and which was observed in the cubic phase is attributed to the quadrupolar relaxation by translational diffusion due to the extra vacancies octahedral positions and also due to the rotation of the sulphate ions in the lithium sulphate solid. The measurement of the relaxation time in the lithium sulphate doped with lithium tungstate confirms this idea.

Studies have also been made of the lithium sulphate-zinc sulphate system using NMR technique.

Key Words

NMR (nuclear magnetic resonance,), Solid electrolytes,
Fast ion conductors = Superionic conductors and Solid state
batteries.

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The superionic phase of lithium sulphate