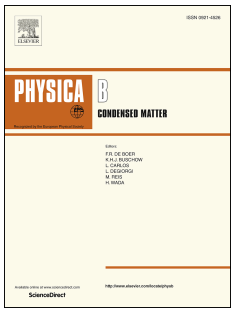
Accepted Manuscript



Conductivity spectra of lithium ion conducting glassy ceramics

Sanjib Bhattacharya, Amartya Acharya, Dipankar Biswas, Anindya Sundar Das, L.S. Singh

PII: S0921-4526(18)30467-8

DOI: 10.1016/j.physb.2018.07.021

Reference: PHYSB 310975

To appear in: *Physica B: Physics of Condensed Matter*

Received Date: 16 May 2018

Revised Date: 18 July 2018

Accepted Date: 19 July 2018

Please cite this article as: S. Bhattacharya, A. Acharya, D. Biswas, A.S. Das, L.S. Singh, Conductivity spectra of lithium ion conducting glassy ceramics, *Physica B: Physics of Condensed Matter* (2018), doi: 10.1016/j.physb.2018.07.021.

Conductivity spectra of Lithium Ion Conducting Glassy Ceramics

Sanjib Bhattacharya[1, *], Amartya Acharya[1], Dipankar Biswas[2], **Anindya Sundar Das** [3] and L.S. Singh[4]

[1]Composite Materials Research Laboratory,
Department of Engineering Sciences and Humanities,
Siliguri Institute of Technology, Darjeeeling-734009, West Bengal, India.

[2]Department of Electronics and Communication Engineering,
Regent Education and Research Foundation, Bara Kanthalia, Barrackpore, Kolkata-700121, India.

[3]Department of Electronics & Communication Engineering, Swami Vivekananda Institute of Science & Technology, Dakshin Gobindapur, Kolkata-700145, India.

[4]Department of Electronics and Communication Engineering,
National Institute of Technology Manipur,
Langol, Imphal – 795001, India.

Abstract

Study of ac conductivity spectra of Li_2O doped different glassy ceramics in wide frequency and temperature regime using Jonscher's power law model and Almond-West formalism reveals that Li^+ migration depends upon nature of doping reagent. It also points that the ratio of power law pre-factor to the exponent ($-\log_{10}$ A/S) indicates temperature and composition dependency of present conductors. Motion of Li^+ may predict that the process of conduction is percolation or pseudo three dimensional types. These glassy ceramics should be suitable candidates for lithium ion battery application. **Improvements in the capacity of modern lithium (Li) batteries can be made by enhancing conductivities and ionic**