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### Variety of Glassy Nanocomposites: Transition from Ion hopping to Variable Range Polar-on Hopping

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In recent days, Li<sub>2</sub>O doped glass-nanocomposites and their crystalline counterparts have been developed. Out of various rechargeable batteries, lithium is supposed to be one of the most promising candidates not only for its role in electric vehicles, mobile computers etc, but also for academic interest. Some short-falls of conventional lithium-ion batteries have been already identified due to highly flammable nature of organic liquid electrolytes or polymer electrolytes. This safety issue may lead the researchers to develop “solid electrolytes” as they exhibit high thermal stability, high energy density and better electrochemical stability. Experimental research on chalcogenide glassy systems also paid much attention because of their higher electrical conductivity at room temperature and large composition flexibility, which made them suitable candidates for rechargeable batteries. Transition metal ions doped chalcogenide glassy systems showed that the electrical conduction mechanism predominated by hopping

of small polarons. To explore the conduction mechanism in chalcogenide semiconductors, the study of frequency dependent electrical conductivity is very much essential not only for practical applications but also for academic interest. A complete description on electrical transport phenomenon and dielectric relaxation of such glassy system is still pending till date because of lack of their micro-structural information and approximation in data analysis.

#### Speaker Biography

Sanjib Bhattacharya completed his PhD in Jadavpur University, India and he is working as an Associate Professor and Deputy Director at the University of North Bengal, India. He is also a life member of the Indian Association for the Cultivation of Science, Neutron Scattering Society of India, Material Research Society of India. His research work has been acknowledged well and published many papers in journals.

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