

## **Ionic conductivity of highly deproteinized natural rubber having various amount of epoxy group mixed with lithium salt**

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### **Abstract:**

Ionic conductivity of highly deproteinized natural rubber having various amount of epoxy group (LEDPNR) mixed with lithium bis (trifluoromethane sulfonyl) imide (LiTFSI) salt was investigated through impedance analysis with respect to salt concentration, glass transition temperature and epoxy group content. The LEDPNR was prepared from depolymerization of epoxidized natural rubber (ENR) latex, which was prepared by deproteinization of natural rubber latex with proteolytic enzyme and surfactant followed by epoxidation with fresh peracetic acid. The resulting LEDPNR was found to have 10-57 mol% epoxy group, low  $M_w$ , and low  $T_g$ . The conductivity of LEDPNR/LiTFSI mixture was dependent on LiTFSI salt concentration and glass transition temperature ( $T_g$ ). The highest ionic conductivity versus salt concentration for the mixtures was found to be due to amount of effective carrier ion and the highest mobility of segment of LEDPNR at a suitable LiTFSI concentration. The ionic conductivity of LEDPNR/LiTFSI mixtures was further dependent on epoxy group content. (c) 2006 Published by Elsevier B.V.

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