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Neutron scattering studies of solid state lithium electrolyte materials LEO ZELLA, None — Lithium electrolyte material research will dramatically impact the future of lithium-ion battery technology. We have investigated lithium electrolyte materials toward improving energy transfer rates in batteries. It has been shown by others that differences in conductivity are observed when materials have been heated. Our hypothesis is that the creation of crystalline subunits within our sample B occur during heating which decreases conductivity. To test this, we used neutron powder diffraction and triple axis spectroscopy to characterize these materials before and after heating. Increased crystallization was observed as inferred from the growth of specific Bragg diffraction peaks during the heating cycle from room temperature to 450K. In-situ diffraction measurements made during the heating cycle, also suggest solid state chemistry takes place that alters the material properties. This suggests that a thermal phase change occurs during heating. The triple axis spectroscopic data analysis of our unheated sample C provides information about energy transfer. From these measurements we can obtain information regarding the nature of the dynamic processes from the observed diffuse scattering in the materials.

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