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Influence of humidity and crystallization time on the conductivity of nanoparticle-filled solid polymer electrolytes SUSAN FULLERTON, JANNA MARANAS, Penn State — The purpose of this study is to investigate two conditions that influence the conductivity of solid polymer electrolytes [SPEs]: humidity and crystallinity. SPEs cannot currently be used in solid-state lithium ion batteries because low room-temperature conductivity precludes effective application. Many modifications have been made to improve the conductivity; however, conductivity results vary widely for the same system investigated within different studies. One explanation is that SPE conductivity is extremely sensitive to experimental conditions which are often not reported. We investigate the consequence of humidity on conductivity, and the time at which conductivity is measured following sample preparation. Specifically, we choose nanoparticle-filled SPEs as an example to demonstrate that various conclusions can be made regarding the influence of nanoparticles on conductivity, depending on the experimental conditions.

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