UC San Diego

JACOBS SCHOOL OF ENGINEERING
NanoEngineering

JIE FANG M.S. THESIS DEFENSE
Professor Zheng Chen Group
PI: Dr. Zheng Chen
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"Study of Polyethylene Oxide (PEO) as an Ionic Conducting Binder for Li-ion Battery Cathode"

Abstract: Li-ion battery has dominated the portable electronic market due to its high energy density. Li-ion battery is a complex system where each of its components should be compatible with each other. Polymer binder, although as an inactive component in a cell, plays an important role for battery performance. Polyethylene oxide (PEO) as an ionic conductive polymer has demonstrated its use in gel polymer batteries and solid state batteries. However, there are concerns about its compatibility with layered oxide material as well as stability under high voltage, therefore, to the best of our knowledge, although Li-ion conductive itself, PEO was not used as a binder or polymer electrolyte for layered oxide materials. This thesis studied the compatibility of PEO as a binder for layered oxide material LiNi1/3Mn1/3Co1/3O2 cathode and the stability of PEO up to 4.4V.

Biosketch: Jie Fang was born in Shenzhen, China. She received her bachelor's degree from Shenzhen University, China in 2016.