

Bingrui Li

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Work Address

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Education	Case Western Reserve University, Cleveland, Ohio, USA	2014-2016
	M.S. Macromolecular Science Advisor: Prof. LaShanda Korley	
	Jilin University, Changchun, Jilin, China	2008-2012
	B.Eng. Polymer Materials and Engineering	

Professional Skills

Synthetic skill: independently conducting multi-step synthesis from mg to g scale. Chromatography, crystallization, purification, water/air-free reactions, Mitsunobu reaction, Gabriel reaction, peptide chemistry, proton exchange reaction, end-group functionalization, thiol-ene reaction.

Polymer synthesis: Free-radical polymerization, condensation polymerization, RAFT polymerization, ring-opening polymerization, polymer functionalization.

Characterization techniques: NMR, MALDI-TOF, UV-Vis, GPC, ATR, DSC, DMA, TGA, SEM, AFM, SAXS/WAXS, Rheometer, Tensile testing.

Professional Experience

Post-Master Research Associate (Sokolov Group, Chemical Sciences Division, Oak Ridge National Laboratory) 2016-present

- *Novel Polymeric Membrane for Gas Separation*
Utilize synthetic strategy to optimize CO₂ separation performance of polymer membranes with enhanced mechanical/self-healing properties. Conduct gas permeation, mechanical and thermal characterizations.
- *High Performance Polymer Binder for Si-Anode*
Synthesize multi-grafted polymers as binders of Si anode, assemble cells and perform cycling tests of the Li-ion batteries.
- *Polymerized Ionic Liquids(PILs)*
Synthesis, functionalization and characterization of polyimidazole based PILs.
Elastic Solid Polyelectrolytes: Fabricate elastic poly(ionic liquid)s by RAFT polymerization and urea chemistry, perform characterizations(thermal, mechanical, dielectric and rheology) of the membrane.
- *Polymeric Vacuum Insulation Panels(PVIP)/Spheres(PVIS)*
Develop the concept of self-healable PVIP and PVIS, fabrication of demo units and SEM analysis.

Master Student (Korley Group, Case Western Reserve University) 2014-2016

- *Bio-inspired Peptidic Polyurea Hydrogel*
Synthesis and characterization of α,ω -Diamino poly(ethylene glycol).
Fabricate PEG-peptide hydrogel by utilizing covalent cross-linking(urea-chemistry).
Investigate peptide ordering's effect on bulk properties.
Gel analysis by utilizing ATR, DSC, AFM, SAXS/WAXS and tensile testing.
- *Electrospun Poly(vinyl alcohol) Nanofiber*
Optimize electro-spinning conditions and conduct SEM analysis.

