Rose Xiaoya Ma

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EDUCATION

University of Delaware, Newark, DE — Aug. 2013 – Present

- Ph.D. candidate in Chemical Engineering
- Redox flow battery modeling & development

California Institute of Technology, Pasadena, CA — Sep. 2009 – Jun. 2013

- B.S. in Chemical Engineering
- Materials track

SKILLS

Experimental techniques

- Experienced in cyclic voltammetry (CV) studies, rotating disk electrode (RDE) studies & electrochemical device testing
- Trained in soft lithography, epitaxy & extensive characterization/imaging methods, *e.g.*, differential scanning calorimetry (DSC), infrared (IR) spectroscopy, nuclear magnetic resonance (NMR) spectroscopy, ultraviolet-visible (UV-vis) spectroscopy, mass spectroscopy (MS), X-ray power diffraction, confocal microscopy, optical microscopy, scanning electron microscopy (SEM)

Modeling techniques

- Experienced in data-driven, multiscale battery characterization & optimization
- Experienced in capital & levelized cost analysis of utility-scale batteries

Programming

- Fluent in C++, R, Mathematica, COMSOL & Office
- Proficient in MATLAB, CAD, Python, HTML & Photoshop

Language

- English (fluent), Chinese (native), French (conversational)

RESEARCH EXPERIENCE

Yan Group, University of Delaware, Newark, DE — Jan. 2014 – Present

- Created a graphical user interface for modeling of flow battery performance & cost
- Developed a robust model for stack voltage of flow batteries, validated with multiple chemistries
- Designed & tested a cost-effective flow battery based on redox reaction screening & a novel anion exchange membrane

Weitz Group, Harvard University, Cambridge, MA — Jul. 2012 – Sep. 2012

- Designed microfluidic devices for high-throughput, controlled-geometry droplet generation
- Characterized *E. coli* encapsulation into S-shaped, crescentic & notched microgels via SEM
- Designed microfluidic devices for *in situ* studies of differentiated biofilm growth
- Characterized *B. subtilis* growth within water-oil-water double emulsions via confocal microscopy

Novartis Center for Continuous Manufacturing,
Massachusetts Institute of Technology, Cambridge, MA — Jun. 2011 – Aug. 2011

- Designed crystallization routes to metastable, pharmaceutically-relevant disappearing polymorphs
- Generalized principles for substrate-directed morphology control in organic crystalline systems

Johnson Group, California Institute of Technology, Pasadena, CA — Jun. 2010 – Jan. 2011

- Optimized glass-forming ability & toughness of Vitreloy 101 (copper-based bulk metallic glass)
- Increased amorphicity by 133% using rational design of interstitial substitutions
- Pioneered gamma-brass alloy with potential for superior mechanical strength & ease of manufacture