Dr. Zhibin Ye

Department of Chemical and Materials Engineering, Concordia University, Montreal, Quebec, Canada
https://www.concordia.ca/faculty/zhibin-ye.html
zhibin.ye@concordia.ca

Education

PhD, McMaster University (Canada), 2004
MEng, Zhejiang University (China), 1999
BEng, Zhejiang University (China), 1996

Appointments

Professor of Chemical and Materials Engineering, **Concordia University** (since 2017)

Canada Research Chair (2011-2017), **Professor** (2012-2017), **Associate Professor** (2009-2012),

Assistant Professor (2004-2009) of Chemical Engineering, **Laurentian University** (2012-2017)

Research Awards

Fellow of Royal Society of Chemistry (2016)
Canada Research Chair (2011-2017)
Canadian Catalysis Lectureship Award (2018)
Concordia Provost's Circle of Distinction (2018)
NSERC Discovery Accelerator Supplement (2015)
Ontario Premier's Early Researcher Award (2007)

Research Expertise

- **Advanced materials for energy storage/conversion systems**, including alkali-ion rechargeable batteries, Li-S batteries, and supercapacitors
- Nanostructured catalytic materials for organic transformations
- Advanced polymers and polymerization techniques

Research Accomplishments

- Awarded over **$4.4M** research funding as PI from major federal/provincial agencies and industries since 2005, plus over $0.4M awarded as co-PI
- Published over **110** peer-reviewed papers in top-tier journals in energy/materials/polymers/chemical engineering fields, with the majority as corresponding author
- Inventor for **5** awarded patents/patent applications (US, China, PCT)

Ongoing Research Projects on Materials for Rechargeable batteries

- Developing high-energy organic cathode materials technology for rechargeable alkali-ion (Li^+, Na^+, and K^+) batteries

  one PCT patent application submitted; technology being commercialized by Aligo Innovation

- Designing high-performance polymer binders for lithium-sulfur and lithium-ion batteries

- Developing 2D materials for high-performance batteries and supercapacitors

- Nanostructured carbon materials for lithium-sulfur batteries and high-energy high-rate supercapacitors

Problems/Opportunities

Solid state batteries with high-energy organic cathode materials

- Solid state batteries: noted for improved safety and energy density relative to lithium ion batteries due to the use of solid state electrolytes instead of liquid phase electrolytes

- Problem for solid state batteries: energy density limited due to the use of metal-based cathode materials

- Opportunity: high-energy organic cathode materials for solid-state batteries

- Advantages for organic cathode materials: higher energy density due to their construction with light elements (C, H, O, S); tunable structures through organic synthesis; sustainability with abundancy of the constituting elements;

  Solid-state battery design eliminates the common solubility problem of organic cathode materials

- Our organic cathode materials designed with a new redox functionality have strong potential to enable solid-state batteries with enhanced energy density.