Xuekui Duan

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Education

University of Science and Technology Beijing, Beijing, China
Degree: Bachelor of Engineering Jun 2015
Major: Materials Science and Engineering

University of Minnesota-Twin Cities, Minneapolis, USA
Degree: Doctorate Jan 2021
Major: Materials Science and Engineering

Awards

National Scholarship, Excellent Students Awards, University of Science and Technology Beijing. 2013

National Scholarship, Excellent Students Awards, University of Science and Technology Beijing. 2014

Chris & Kathleen Macosko Fellowship, University of Minnesota, Department of Chemical Engineering and Materials Science. 2015

Excellent Teaching Assistance Award, University of Minnesota, Department of Chemical Engineering and Materials Science. 2018

Research Background

My research background is on the rational design and engineering of advanced zeolite membranes, with applications including hydrocarbons separation, organic/water pervaporation and gas separation.

Research Experience

Project 1: Fabrication of Zeolite MFI Membranes on Low Cost Polymer Supports
Research Assistant Dec 2015 to Jun 2017

- Synthesized multi-lamellar MFI particles;
- Exfoliation of multi-lamellar MFI particles to get single MFI nanosheets by polymer compounding;
- Preparation of low cost polymer (PES, PVDF, PI, PBI) supports, including both the flat sheet type and hollow fiber type;
- Fabrication of MFI membranes on home-made polymer supports.
- Membrane performance on separating n-butane/iso-butane was tested.

Project 2: MFI Nanosheet Membranes for H_2/Hydrocarbons Separation
Research Assistant Jun 2017 to Sep 2018

- Prepared MFI nanosheets by bottom-up synthesis (direct synthesis) method;
- MFI nanosheets were used as seeds for membrane fabrication on silica supports;
- Membrane performance on separating H_2/different hydrocarbons (C_2-C_4) was tested.

Project 3: NaA Membranes for Humidified Air Separation
Research Assistant Jun 2017 to Sep 2018

- Prepared NaA nanocrystals as seeds for membrane fabrication;
- NaA membranes on alumina supports were prepared by secondary growth method;
- Membrane performance on separating water vapor from humidified air was tested.

Project 4: MFI Membranes for Xylene Separation
Research Assistant Sep 2018 to Dec 2020

- Robust method of making MFI membranes on alumina supports was established;
- Membrane performance on separating xylene vapors was tested.

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