Current Areas of Research

Selective oxidation catalysts: epoxidation, hydroxylation, fine chemical production

Solid acid catalysts: dehydration, transesterification, condensation reactions, biomass conversion

Polymerization catalysts: poly-olefins, polyesters

New porous materials: sorbents, hydrogen storage
The Barnes Group

Research program in three intersecting areas

1. **Synthetic Chemistry**: Inorganic, organometallic and Organic
2. **Materials Chemistry**: Nanostructured solids for catalysis
3. **Chemical Engineering**: Developing next generation catalysts

More active  More selective  More stable

Becoming a PhD Scientist:

Students in my group will be technical competent to help lead research initiatives. They will be able to present themselves and their work to colleagues. They will become the next generation of leaders in materials science and catalysis.
Imprinting strategy for titanium sites in porous, silica building block matrices

Left: Schematic illustrations of a 4-connected Ti site in silicate matrix before and after neutral pyridine ligands are remove through heating (150°C).

Right: EXFAS data that follow presence-loss-reappearance of Ti-N feature of pyridine nitrogen.