

## Olefin Polymerization Catalysis Research at Dow Core R&D

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Polyolefin production is a critical technology for Dow. This seminar details various aspects of olefin polymerization catalysis research in the Chemical Science division of Dow's Core R&D, with the focus on two projects. First, molecular olefin polymerization catalysts with multidentate guanidine-ether ligands are discussed, including ligand synthesis and metalation, single crystal X-ray structures, and activation studies to investigate ligand binding in the catalytically active species. The second portion discusses work done in collaboration with the Ozerov group at Texas A&M towards the development of new polyolefin precatalyst activators based upon carborane anions. Catalysts produced from reaction with activators containing the  $[\text{HCB}_{11}\text{Cl}_{11}]$  anion have been shown to exhibit comparable activity to reaction with activators based upon the incumbent anion  $[\text{B}(\text{C}_6\text{F}_5)_4]$ . The high stability and crystallinity of the  $[\text{HCB}_{11}\text{Cl}_{11}]$  anion allowed for the isolation and characterization, *via* single crystal X-ray diffraction, of an amine-bound activated catalyst. Throughout the talk, Dow's unique world-class tools and workflows for polyolefin catalyst characterization and evaluation will be highlighted, including high throughput screening facilities and lab-scale semi-batch production reactors.