

**Novel families of chiral *ansa*-zirconocenes:**

**Synthesis, Structure and Performance in Propene Polymerization**

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Metallocene catalysts have been one of the most actively investigated research topics for more than 30 years. Studies of various bridged indenyl metallocene complexes, i.e. *ansa*-metallocenes, have demonstrated that the activity and the stereoselectivity of olefin polymerization reactions can be significantly affected by slight structural variations of the bridging groups and ring substituents in metallocene catalysts. Since the discovery that  $C_2$ -symmetric ethylidene bridged bis-indenyl metallocene complexes activated with methylalumoxane formed catalysts capable of producing highly isotactic polypropylene, numerous Group 4 *ansa*-metallocene complexes have been developed and applied as olefin polymerization pre-catalysts. In this report, the effects of unusual bridges and specific substitution of the indenyl moieties on the performance of *ansa*-metallocene catalysts are presented. Several novel families of *ansa*-zirconocenes of  $C_2$  symmetry were designed and synthesized that show promise as pre-catalysts for the highly stereoselective polymerization of propylene. Their structures as well as performance (being activated by MAO) as catalysts in propylene polymerizations were studied in detail.