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(54) Title: CATALYST SYSTEMS FOR PRODUCING POLYMERS HAVING BROAD MOLECULAR WEIGHT DISTRIBUTIONS AND METHODS OF MAKING THE SAME

(57) Abstract: Catalyst systems for polymerizing olefins include a catalyst comprising chromium and a cocatalyst comprising a substituted or unsubstituted non-transition metal cyclopentadienyl (Cp) compound. The catalyst also comprises an inorganic oxide support. Methods of preparing a catalyst comprise contacting a support with chromium and with a non-transition metal Cp compound. The support can be contacted with a solution comprising the non-transition metal Cp compound prior to entry into a reaction zone. Methods of polymerizing at least one olefin include contacting the olefin with a catalyst comprising chromium and with a cocatalyst comprising a non-transition metal Cp. The polymerization can be performed in the presence of hydrogen. Using the cocatalyst in conjunction with the catalyst increases several properties of the polymers produced by this method. Polymer compositions produced by such methods have various unique properties, including a PDI greater than 30.



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