

Abstract

The present invention provides a process for preparing high melt strength propylene polymer by direct polymerization, comprising that a propylene polymer with wide molecular weight distribution and containing "very high molecular weight fraction" can be prepared by controlling the species and ratios of the external electron donors in the Ziegler-Natta catalyst system at different reaction stages according to the requirement for different molecular weight fractions in the different propylene polymerization stage of the series operation, and said polymer has excellent mechanical properties, especially with very high melt strength. The present invention also provides a propylene homopolymer with high melt strength, comprising the following features: (1) the MFR is 0.2-10g/10min at 230°C with a load of 2.16kg; (2) the molecular weight distribution M_w/M_n is 6-20; (3) the content of the fraction with a molecular weight higher than 5,000,000 is higher than or equal to 0.8wt%; (4) M_{z+1}/M_n is higher than or equal to 70. Said homopolymer can be used in the preparation of foam products, thermoforming products, biaxial stretching films, blown films and blow-molded products.