

عنوان مقاله:

Synthesizing polypropylene with percolation network catalyzed by inorganic nanoparticles-functionalized Ziegler-Natta catalyst

محل انتشار:

فصلنامه پلی اولفین ها، دوره 11، شماره 2 (سال: 1403)

تعداد صفحات اصل مقاله: 11

نویسندگان:

Tingting Yang - Taiyuan University of Technology, Taiyuan, Shanxi ۰۳۰۰۲۴, China

Ao Li - Jinneng Holding Group, Datong, Shanxi ۰۳۷۰۰۰, China

Yawei Qin - CAS Key Laboratory of Engineering Plastics, Institute of Chemistry, Chinese Academy of Sciences, Beijing ۱۰۰۱۹۰, China

Jin-Yong Dong - CAS Key Laboratory of Engineering Plastics, Institute of Chemistry, Chinese Academy of Sciences, Beijing ۱۰۰۱۹۰, China

خلاصه مقاله:

Polypropylene is one of the most widely used synthetic resins, which is mainly synthesized with Ziegler-Natta catalysts. In this paper, the functionalized Ziegler-Natta catalyst is applied to prepare high-performance polypropylene. A new way to synthesize functionalized Ziegler-Natta catalysts is to dope with inorganic nanoparticles. The $MgCl_2/TiCl_4/BMMF$ catalysts doped with halloysite nanotubes were prepared and applied to synthesize polypropylene containing less than $20 \cdot ppm$ halloysite nanotubes. It is found that doping nanotubes in Ziegler-Natta catalyst has little impact on the structure, composition and activity of the catalyst, and polypropylene with high isotactic degree and molecular weight was synthesized with the functionalized Ziegler-Natta catalyst. Halloysite nanotubes are found to be dispersed in polypropylene in the form of individual nanotube, forming percolated network in the polymer melt effectively. Moreover, the polypropylene containing halloysite nanotubes exhibited better mechanical and thermal resistance properties as compared with conventional polypropylene, and the thermo-oxidative properties of which do not deteriorate as the introduction of nanotubes. This research provides a facile way to relieve the contradiction between the high activity of catalyst and high content of nanoparticles during the preparation of polyolefin nanocomposites by in-situ polymerization, and a new idea to prepare polyolefin nanocomposites by in-situ polymerization

کلمات کلیدی:

Ziegler-Natta catalyst, Polypropylene, Halloysite nanotubes, Doping in situ, Percolation network

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1997658>

