Yixin Ren et al., Chem Sci J 2017, 8:3 (Suppl)
DOI: 10.4172/2150-3494-C1-012

Neodymium based catalyst NdCl3•4TEP for polymerization of diene monomers

Yixin Ren, Polo Plascencia, Michael C. Biewer and **Mihaela C. Stefan**
University of Texas, USA

The Ziegler-Natta catalyst was discovered in the 1950's by Karl Ziegler and Giulio Natta for the commercial polymerization of petroleum-based olefins and dienes. A current research direction is finding green alternatives for petroleum-based monomers to produce elastomeric materials, and diene terpene monomers like myrcene and isoprene are readily available non-toxic and renewable resources from the plants and trees. Neodymium based Ziegler-Natta type catalysts for polymerization of dienes have garnered research interest owing to the high yield of *cis*-1,4 content. In specific, $NdCl_3$•3TEP (TEP = triethyl phosphate) when combined with the co-catalyst triisobutylaluminum (TIBA) has shown the stereospecific polymerization of myrcene and isoprene yielding more than 95% of *cis*-1,4content. $NdCl_3$•4TEP contains one more TEP ligand than $NdCl_3$•3TEP creating a bulkier ligand environment resulting the increase control of the molecular weight distribution with lower polydispersity index (PDI = 1.57). The synthesized catalyst $NdCl_3$•4TEP was characterized using ^{1}H and ^{31}P NMR and IR techniques. Di-block copolymers poly(myrcene)-block-poly(isoprene) via sequential monomer addition were successfully synthesized demonstrating the living nature of the catalytic system.

Biography

Yixin Ren is a McNair scholar. He received his BS degree in Chemistry & Medicinal Chemistry from the University at Buffalo in 2012. He subsequently completed his M.S. degree in chemistry from the Illinois State University in 2014 under the supervision of Lisa F. Szczepura. He is currently working on his PhD in chemistry at the University of Texas at Dallas under supervision of Mihaela C. Stefan. His current research endeavors are focused on neodymium-based catalysts for polymerization of dienes and vinyl monomers and ring opening polymerization of cyclic esters.

yxr140330@utdallas.edu

Notes: