Ring-opening metathesis polymerization of norbornene and norbornadiene by tungsten(II) and molybdenum(II) complexes.

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Streszczenie

The reaction of norbornene (NBE) and norbornadiene (NBD) in the presence of seven-coordinate tungsten(II) and molybdenum(II) complexes of the $[(CO)_4M(\mu\text{-}Cl)_3M(SnCl_3)(CO)_3]$ and $[MCl(M'Cl_3)(CO)_3(NCMe)_2]$ (M=W, Mo; M′=Sn, Ge) types leads to ring-opening metathesis polymerization (ROMP) and to the formation of high molecular weight polymers. The geometric structure of these polymers was determined by means of - and -NMR spectroscopy. The monitoring of the reaction between cyclic olefins and the metal complex by means of -NMR spectroscopy allowed us to observe the coordination of NBD to metal atoms in the initiation step of the polymerization process. Compounds of the $[MCl(SnCl_3)(CO)_3(\eta^4\text{-NBD})]$ type prepared directly from $[(CO)_4M(\mu\text{-}Cl)_3M(SnCl_3)(CO)_3]$ or $[MCl(M'Cl_3)(CO)_3(NCMe)_2]$ (M=W, Mo) in the presence of an excess of NBD initiate the ROMP reaction immediately. The detection of the first-formed products in the reaction between the metal complex and cyclic olefins provides valuable information concerning the nature of the initiating species.

Słowa kluczowe

Metathesis polymerization of cyclic olefins, Tungsten(II) catalyst, Molybdenum(II) catalyst, Seven-coordinate complexes

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