Iron Catalyzed Ring-Opening Metathesis Polymerization (ROMP)

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Overview

A novel iron-catalyzed Ring-Opening Metathesis Polymerization (ROMP) of olefins, which leads to several new catalytic reactions and enables the synthesis of new polymeric materials. This breakthrough replaces the costly and toxic Mo- and Ru-carbene catalysts that currently dominate olefin metathesis chemistry, using a catalyst based on earth-abundant iron.

Applications

- New polymeric materials (i.e. Polydicyclopentadiene, Polyoxanorbornene and Cyclooctene-based polymers).
- · New engineering materials.
- Industrial-scale production of polynorbornene using iron-based catalysts

$$\begin{array}{c} 0.1 \text{ mol}\% \\ \hline C_6H_6, 25 \, ^{\circ}\text{C} \\ \hline 20 \text{ h} \\ \end{array}$$

Iron-catalyzed ROMP of norbornene

Differentiation

- Economical
- Bio-compatible
- Forms high molecular weight polynorbornene

Development Status

The researchers have shown the ability to systematically perform the catalysis on a lab scale to produce Polynorbornene.Â

Patent Status

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