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Manganese Hydrofunctionalization Catalysts Featuring Beta-Diiminate Ligands

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Background

The process of olefin hydrosilylation is widely used in the manufacturing of silicone-based materials that include coatings, adhesives, sealants, and cured rubbers. Unfortunately, the catalysts used for this transformation feature relatively toxic metals including platinum, rhodium, and iridium.

Furthermore, platinum, rhodium, and iridium are extremely expensive. Due to the cost and low Earth abundance of these precious metals, inexpensive alternatives that exhibit considerable olefin hydrosilylation activity are desirable.

Invention Description

Researchers at ASU have developed a new class of catalyst that can be used to mediate olefin hydrosilylation reactions. These compounds are sustainable in that they feature a non-toxic manganese center and a supporting ligand that is readily prepared from inexpensive starting materials. Given the non-toxic nature of the catalyst, this innovation may prove to be particularly valuable for applications such as the curing of medical grade tubing and implants, especially when platinum toxicity and nickel allergies are to be avoided.

Potential Applications

- Olefin hydrosilylation
- Hydroboration
- Medical grade tubing
- Surface modification

Benefits and Advantages

- Adaptable – The described catalyst is active with a broad range of

substrates.

- Cost – Manganese is earth abundant, Platinum, the main competition, is extremely costly
- Safe – Manganese is an essential nutrient at relevant concentrations; whereas platinum is toxic.

[Original Document](#)

[Professor Trovitch's Website](#)