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## Intellectual Property

### Status:

Patent Pending

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# Late First-Row Transition Metal Hydrogenation and Hydrosilylation Catalysts

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## Background

The processes of Hydrosilylation or Hydrogenation are widely used in the manufacturing of silicone-based materials and as a precursor in pharmaceuticals. These materials include coatings, adhesives, sealants, and cured rubbers. These processes rely on the use of metal catalysts. Unfortunately, these catalysts are relatively toxic, rare, and are very expensive. The metals used in these catalysts include platinum, palladium, rhodium, and ruthenium. Due to the cost and availability of the precious metals required to manufacture the catalysts, an inexpensive alternative is needed that provides sustainable alternatives. It is important that a new catalyst exhibit the same qualities as those currently used in manufacturing.

## Invention Description

Researchers at Arizona State University have developed a new compound for use as a catalyst in Hydrosilylation or Hydrogenation reactions. This material is sustainable, uses abundant metals including manganese, iron, cobalt, or nickel, and it becomes a compound that contains a supporting ligand. This innovation exhibits the qualities that make it a very desirable catalyst, and it is far less expensive than products currently on the market. In addition, the compound is less toxic to the environment than the catalysts it would replace.

## Potential Applications

- Silicon sealants, coatings, and adhesive products
- Tire manufacturing
- Pharmaceuticals

## Benefits and Advantages

- **Lower Costs** – Uses inexpensive, abundant materials
- **Environmentally Sound** – Uses materials that have low toxicity
- **Retrofit** – Can be used as a substitute for existing catalysts