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## HETEROGENEIZED NHC COMPLEXES OF PALLADIUM AND THEIR USES AS RECOVERABLE CATALYSTS

### Patent

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WO2015197891

### Code

QUI\_UAH\_07

### Application areas

- Industrial Manufacture, Material and Transport technologies
- Other Industrial Technologies
- Agriculture and Marine Resources

### Type of Collaboration

- Technical cooperation
- Commercial agreement with technical assistance
- License agreement

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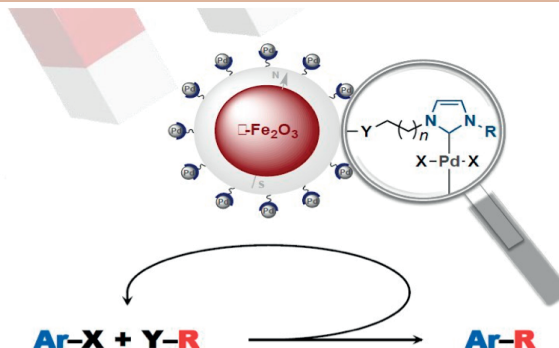
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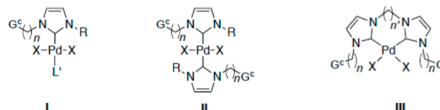


### ABSTRACT

This invention involves the synthesis of (NHC) palladium complexes (PCs) with suitable substituents for their covalent grafting onto magnetic nanoparticles (MPs), resulting in nanomaterials containing the supported complexes (CMPs) as unique and well defined species of palladium tightly bound to the support. The CMPs give rise to stable dispersions in water and catalyze carbon-carbon bond formation processes in aqueous medium under mild conditions.

The invention is related to different aspects:

- New PCs of typologies I, II, and III.



- Synthetic methods for the new PCs of types I, II, III and their precursors.
- Procedures for the immobilization of types I, II, and III onto magnetic particles (MPs) of iron oxide to generate magnetic particles containing the supported complexes (CMPs).
- Use of such CMPs as catalysts for carbon-carbon coupling reactions.

### ADVANTAGES AND INNOVATIONS

These catalysts are well defined, and after their use are easily separated from the products without degradation, they can be reused and do not contaminate the product with leached palladium, resulting in products of the catalysis with contents of less than ten parts per million, and sometimes even in the order of parts per billion, after magnetic separation of the particles.

The advantages of these catalysts are:

- Activity under mild conditions and in aqueous media.
- Robustness of the catalyst, which leads to a very high productivity.
- Ease separation from the catalytic products.
- Very low levels of palladium leaching, leading to products in which further work up to eliminate that metal it is not necessary.