

Technology Opportunity Bulletin

Palladium (Pd) Scavenger and Catalyst

Description:

A functionalized mesoporous silica material has been developed by Dr. Cathleen M. Crudden and co-workers at Queen's University using sol-gel technology. This material contains active metal binding sites not only on the external surface but throughout internal channels of the silica matrix as well. Therefore, this material affords more efficient metal binding and larger capacity of metal scavenging. After scavenging, materials containing catalytically active metals such as Pd can be used as a catalyst. In the case of metals such as Hg or Au, the material may be of more interest for removal and recycling of these expensive or toxic metals.

Benefits:

As a scavenger, this material has advantages of large capacity and high efficiency in metal recovering allowing for using less scavenger material, time, and treatment cycles. This material can:

1. effectively remove palladium from both organic and aqueous solutions
2. reduce palladium concentration down to 1 ppb level
3. remove a wide range of transition metals including noble metals and heavy metals

After a scavenger being loaded by palladium, it can be used as a catalyst in coupling reactions, hydrogenations, and debenzylation reactions. The generated catalyst has advantages of being:

1. extremely low metal leaching
2. very stable
3. completely recyclable

Applications:

This technology can be applied in the processes of removing metals from products, intermediates, and waste streams for pharmaceutical industries, agrochemical industries, fine chemical manufacturing, electronic industries, and mining industries.

Status of Commercialization:

PARTEQ Innovations, the technology transfer office of Queen's University, is seeking industrial partners interested in supporting ongoing development of the product and/or who are interested in licensing the intellectual property.

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