

RESUMEN DE I+D

Patente

Knowledge Area

- Chemistry
- Pharmaceutical Chemistry
- Catalyst

Collaboration

- Technology available for licensing
- Other collaborations

Ref. OTRI

201683R-Pardo, E.

Procedure for Cycloheptatriene and Cycloheptatriene Derivates Synthesis using a New Catalyst.

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Background: Cycloheptatrienes and their derivatives are compounds with high potential in Fine and Pharmaceutical Chemistry, but due to the difficulties existing on their preparation, their use is limited. Unlike the classic 5 or 6 member cycles, widely used in industry, 7 member cycles have a high steric impediment and, consequently, very different chemical properties. This synthetic process is catalyzed so far with rhodium complexes in solution, which are very expensive, toxic and non-reusable.

Development of catalyst to outperform industrial process and technological advanced societies go hand by hand since the last two centuries. In this regard, subnanometric metal clusters attract the interest of the chemical industry because they show an extremely high catalytic activity and very good selectivity for different organic reactions. Despite some synthetic improvements, more efforts are required to synthesize these clusters in a controlled manner as well as to better determine their structure, nuclearity and shape in order to achieve better yields in catalysis.

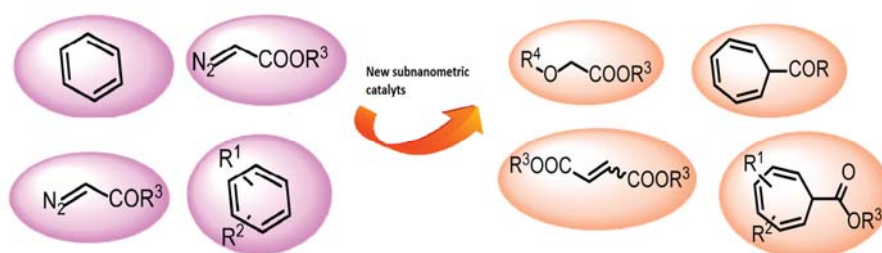
The invention: Researchers from the University of Valencia in collaboration with researchers from the Institute of Chemical Technology (Institute of Polytechnic University of Valencia mixed with Spanish National Research Council) have developed a novel subnanometric catalyst for the synthesis of cycloheptatrienes.

The synthetic procedure is simple and the solid catalyst is stable, thus, it can be recovered and reused repeatedly, maintaining its activity and catalytic selectivity allowing the obtention of cycloheptatrienes in an easy way with a high performance and selectivity with respect to the process existing until now. In this way, the catalytic system allows the production of cycloheptatrienes, with a price of around 10 euros per kg.

Applications: The invention is applicable to industrial scale. Cycloheptatrienes can be used as a "building blocks" in the synthesis of taxanes and rotaxanes, which are very important compounds in pharmaceutical chemistry. Additionally, they can be used as fragrances, as well as precursors in the synthesis of polymers.

Advantages: The main advantages provided by the invention are:

- **Stability of subnanometric clusters:** Due to its stability for the first time, it had been properly characterize.
- **Reusable:** without losing catalytic activity.
- **One-stage procedure for the obtention of cycloheptatrienes and its derivatives** (great variety) which simplifies the existing processes for the preparation of these products.
- **Improves process performance and selectivity** with respect to the state-of-the-art.
- **Cost reduction:** the catalyst operates in flow for hours allowing to recycle the solvent and is also reusable
- **Easy process scalability:** the simplicity of the process for preparing the catalyst allows an easy scale up of the production.



One- stage synthesis of cycloheptatrienes using the new subnanometric catalyst

OTRI oficina de transferència de resultats d'investigació

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