

# Solvay Colloquium



## Professor Avelino Corma CSIC, Valencia, Spain

### Molecular Design of catalysts: From the fundamentals to the Industrial application

Catalysis has very strong economic and strategic impact, since most industrial chemical process involve, at least, one catalytic step. While fundamental knowledge can be, relatively fast, transferred into the design of molecular catalyst, this is much straight forward in the case of solid catalyst. In fact, heterogeneous catalysis has mainly advanced by accumulated knowledge, trial and error and judicious interpretations of results.

However, today, catalysis by solids benefits from advances in nanomaterial synthesis, detailed catalyst surface, characterization under reaction conditions, and computational chemistry. This multidisciplinary approach allows a better approach to the molecular design of solid catalysts.

We will present how through the knowledge of reaction mechanisms by means of kinetics and isotopic studies, computational chemistry, and materials synthesis one may approach to the design and preparation of solid catalysts with well defined (or multiple) isolated, active sites. This molecularly designed solid can include single metal, metal nano-clusters and nanoparticles, acid and basic sites that can be introduced in confined species in an attempt to approach the behaviour of enzymes. We will present how the fundamental knowledge and materials developed can be transformed into industrial catalysts for chemical processes.

**Tuesday 24 April 2018 at 4.00 P.M.**

COFFEE AND TEA WILL BE SERVED AT 3.45 P.M. IN FRONT OF THE SOLVAY ROOM

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