CATALYSIS FOR THE ASSEMBLY OF M_nL_{2n} NANOSPHERES AND THE APPLICATION OF M_nL_{2n} NANOSPHERES IN CATALYSIS

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The interface between supramolecular chemistry and transition metal catalysis has received surprisingly little attention in contrast to the individual disciplines. It provides, however, novel and elegant strategies that lead to new tools for the search of effective catalysts, and as such this has been an important research theme in our laboratories.[1] In this presentation I will focus on the formation of nanospheres[2,3] by self-assembly. We report the pathway of formation and how this can be influenced leading to faster formation. As these nanospheres can create catalysts (and substrates) at high local concentration, just like in enzymes, higher reaction rates are observed for several reactions that operate via binuclear mechanism. Also, they provide new tools to generate nanoaprticles of controlled size and control catalytic events in complex media.

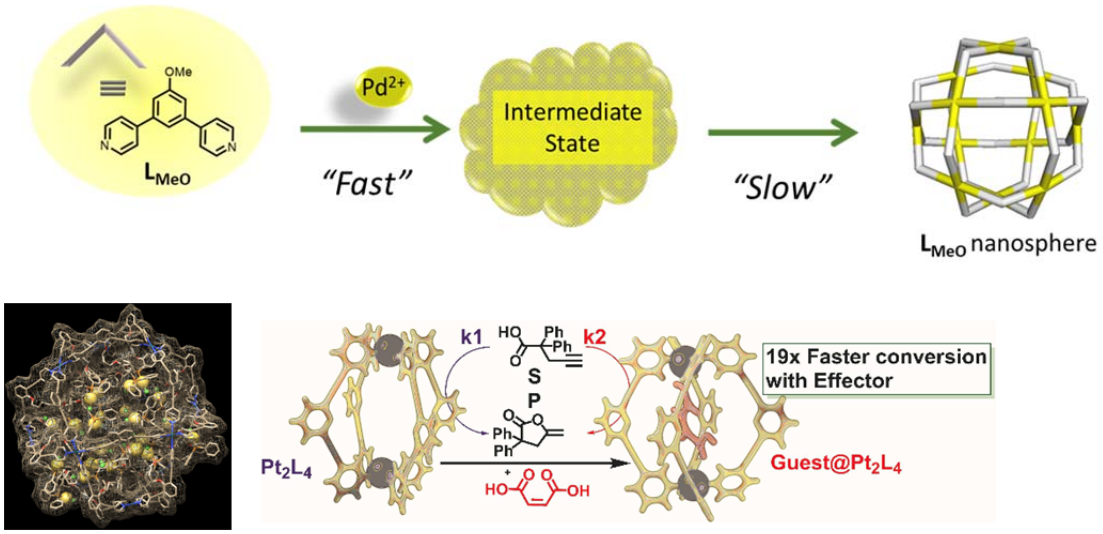

Figure 1: Top: formation of nanospheres. Bottom: an example of a nanospheres and effector controlled catalysis using nanospheres

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[1] For reviews see: 1) Reek et al, *Nature Chemistry*, **2010,** *2*, 615. 2) Reek et al, *Chem. Soc. Rev*, **2015**, *44*, 433 – 448 3) *Chem. Soc. Rev.* **2008**, *37*, 247. 4) Reek et al., *Acc. Chem. Res.* **2018**, *51*, 2115. 5) *ACS Catal.* **2018**, *8*, 3469. 6) *ChemAsianJ*. **2021**,*16*, 3851. 7) *Chem. Sci*., **2021**, *12*, 50

[2] Pioneering work on nanospheres: Fujita, etal. 1) *Angew. Chem. Int. Ed.* **2004,** *43*, 5621 2) *Science* **2010**, *328*, 1144 3) *Chem. Commun*. **2009**, *13*, 1638. 4) J.P Stang et al. J. *Am. Chem. Soc.* **1999**, *121*, 10434.

[3] For some of our work on nanospheres: 1) J.N.H. Reek et al., "*Nature Chemistry*, **2016** *8*, 225-230; 2) *Angew. Chem., Int. Ed.*, **2014,** *52*, 13380; 3) *Angew. Chem., Int. Ed.*, **2018,** *57*, 11247; 4) *Chem. Sci.*, **2019**,*10*, 1316. 5) *J. Am. Chem. Soc.* **2020,** *142* (19), 8837. 6) *Angew. Chem. Int. Ed. Engl.* **2020**,*59*, 18485 7) *Nature Chemistry*, **2023,** under review.