Organic transformations catalyzed by supported noble metal nanoparticles and polyoxometalates

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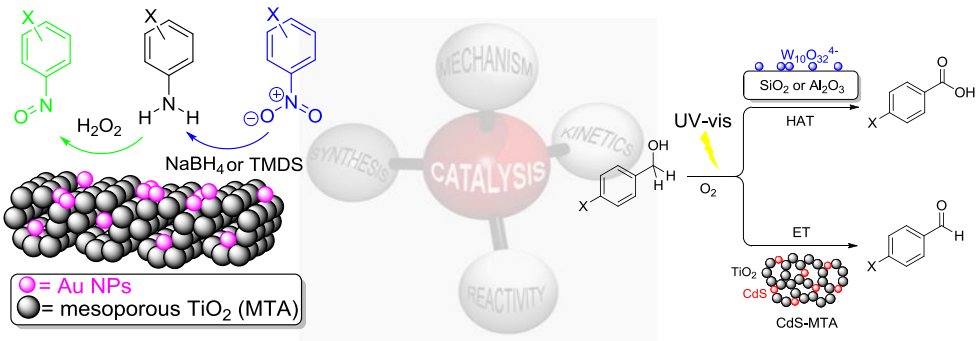
For catalytic processes, an attractive approach is the use of a solid, recyclable catalyst and environmentally friendly reagents. The use of supported catalysts on a well ordered metal oxide surface for heterogeneous catalysis offers several advantages on the catalyst reusability and the regio- and chemo-selectivity of the reaction process. Thus, herein we outline a research study aimed to gain insight into the catalytic applications of new AuNPs and AgNPs heterogeneous systems,[1] as well as supported polyoxometalates[2] in order to afford new catalytic chemical transformations, based on the combination of metal nanoparticles and the surface of the support properties.[1-4] For this reason, the catalytic reduction of nitro aromatic compounds by AuNPs or AgNPs supported catalysts using $NaBH_4$ and 1,1,3,3-tetramethyldisiloxane (TMDS) as hydrogen donor molecules[5] and the selective oxidation of aryl amines into nitrosoarenes with H_2O_2 catalyzed by Au/TiO_2 were studied. In parallel, the general applicability and the mechanistic approach of the selective photooxidation of various benzyl alcohols into the corresponding carbonyl compounds, over mesoporous CdS or POM-TiO_2 assemblies, using O_2 as "*green*" oxidant were also studied.[6,3] Finally, detail mechanistic studies based on kinetic isotope effects, on Hammett type-kinetics and product analysis were performed.



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