

Reasoned design of CoRu nanoalloys and application for catalytic dehydrogenation

Nanoalloys have emerged as an important class of materials, displaying synergetic properties compared to monometallic nanoparticles (NPs) in different fields. Among the soft chemistry routes used to prepare nanoalloys, the polyol process has revealed particularly interesting as the solvent is also the reducing agent and the synthesis is carried out at a sufficiently high temperature, 180 to 300 °C, to allow good crystallisation. However, many parameters influence the morphology and structure of the NPs obtained and more understanding of the mechanism of reduction and formation is required to rationalize the synthesis procedure, especially when bimetallic NPs are concerned. This talk will illustrate, through the case of CoRu nanoalloys, the input of spectroscopy, UV-visible and *in situ* X-ray absorption, and of complementary techniques to monitor the evolution of metal species during heating and understand the influence of one metal center on the reduction of the other. The improvements of the catalytic properties provided by alloying on the dehydrogenation of alcohols will also be shown.

