



Characterization Analysis of Heterogeneous Catalysts

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Message from the Guest Editors

It is well known from ex situ structural characterisation that the morphology, composition and crystalline structure of the catalysts evolve during catalytic reactions. Undoubtedly, significant progress has been made in using in situ X-ray diffraction (XRD), hard XAS and X-ray computed tomography studies. However, taking into account that the metal active site loading in the sample is often only a few percentage points, the measured signal mainly originates from the bulk volume and not from the surface where the reaction takes place.

One of the major problems related to the operation of heterogeneous catalysis is the loss of catalyst activity with time-on-stream which refers to deactivation. The catalyst deactivation is likely to occur through poisoning of catalyst-active phase, sintering of the catalyst and blockage of the active sites. This process is inevitable, but it can be slowed or prevented, and some of its consequences can be avoided. Thus, gaining new knowledge of the catalyst deactivation process and its origin is crucial to design more efficient and robust catalytic materials.

