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Structural study of functional nanomaterials by combining in situ X-ray total scattering and NMR spectroscopy

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The confined functional molecular nanomaterials have attracted considerable interest owing to their potential applications in various domains: catalysis, optics, medicine [1-3]. It is therefore essential to study the structural organization of such nanomaterials. We will show in this contribution that detailed structural information can be obtained by using an appropriate multiscale approach combining various experimental techniques such as X-ray total scattering coupled to in situ atomic Pair Distribution Function (PDF) and solid-state NMR spectroscopy. This multiscale approach does provide more extensive and accurate structural information [4-5]. We will also discuss the effect of size reduction on the interesting physical properties of these functional nanomaterials from a new method we developed in our laboratory for analysing the PDF data. This method allows extracting and analysing the contributions of different species.

Summary

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