All you ever wanted to know about SAXS: What, why, how and when!

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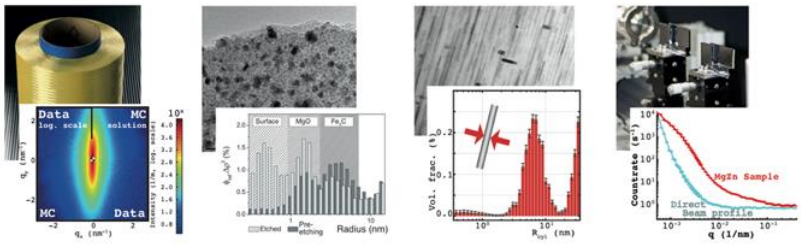
Estimating the size of hundreds of little dots on an electron micrograph isn't necessarily the most fun way of quantifying your materials' nanostructure. Furthermore, with microscopic techniques inherently limited to observing microscopic volumes, you can never be sure that what you see is representative for your entire sample. Ideally, then, you would combine your microscopy with another technique more suited for bulk- scale nanostructural quantification.

Theoretically, small angle X-ray scattering (SAXS) can fill this space: it can characterise the nanostructure of large amounts of material with a minimum of fuss, easily extracting ! size distributions and volume fractions. Practically, however, one of the biggest stumbling blocks in its application is the data correction and analysis, in particular for polydisperse systems.

This talk will give several examples where good SAXS has been instrumental to the success of particular projects. Before that, we will start with a short but explicit introduction to SAXS, with



helpful hints and tips on how to get good SAXS [1]. One novel route for the unambiguous interpretation of scattering will also be presented [2], and its application demonstrated in studies of precipitation in metals [3], nanostructure in gelatin-derived catalysts [4] and for pore structure determinations in fibres [5]. The talk will end with a brief overview of our Ultra-SAXS efforts designed to drastically extend the measurement range of traditional SAXS.

[1] Pauw, B. R. J. Phys. - Cond. Matter, 25 (2013), 383201.
[2] Pauw, B. R. et al., J. Appl. Cryst., 46 (2013), 365 - 371
[3] Rosalie, J. M. and Pauw, B. R.,! Acta Mater., 66 (2014)
[4] Schnepp, Z. et al., J. Mater. Chem. A, 1 (2013), 13576 - 13581
[5] Pauw, B. R. et al., in preparation, arXiv: 1303.2903