

ATOMIC-SCALE STRUCTURE OF POLYMERS AND COMPOSITES

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Knowledge of the atomic scale structure is an important prerequisite to understanding and predicting properties of materials. With crystals it is routinely obtained by Bragg x-ray diffraction. Many polymers and composite materials, however, lack the extended order of usual crystals rendering traditional x-ray crystallography useless. We will demonstrate the usefulness of a non-traditional experimental approach to the 3D structure of polymers and composites based on synchrotron radiation total x-ray scattering and atomic Pair Distribution Function Analysis. Results from recent studies on PAMAM dendrimers [1], polyaniline (PANI) and PANI-V₂O₅ composites [2], and polymeric-metallic (Ag, Pt, Au) nanocomposites, used in catalysis, drug delivery and biolabeling [3], will be presented.

[1] V. Petkov, V. Parvanov, D. Tomalia, D. Swanson, D. Bergstrom and T. Vogt, *Solid State Comm.* **134** (2005) 671.

[2] V. Petkov, V. Parvanov, P. Trikalitis, Ch.Malliakas, T.Vogt and M. Kanatzidis, *J. Am. Chem. Soc.* **127** (2005) 8805.

[3] Work in progress

The Abstract may be posted on the DXC www site

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