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Nanopore structure from USAXS/SAXS in advanced carbon materials for hydrogen storage[1] MICHAEL KRAUS, M. BECKNER, D. STALLA, C. WEXLER, P. PFEIFER, Dept of Physics, U Missouri, J. ILAVSKY, X-ray operations division, Argonne National Lab — Despite their mass-production and industrial use, there is still no generally accepted structural model of non-graphitizing activated carbons. We will show how USAXS/SAXS can be used to estimate the average shape and size of nanopores in amorphous carbon used for methane and hydrogen storage. Simulated scattering curves constructed from explicit experimental N_2 isotherm pore size distributions reveal that nanoporous activated carbons scatter as correlated networks of pores with scattered intensities that depend largely on sample porosity. Graphical methods will be used to show how porosity can be calculated from SAXS data, using minimal model-dependent assumptions. The results are shown to be in excellent agreement with porosity values measured via N_2 sorption isotherms.

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Michael Kraus
Dept of Physics, U Missouri

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