

GI-MS46-P03 | AN EFFECTIVE NEUTRON CROSS SECTION FOR HYDROGEN IN ORGANIC COMPOUNDS

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The wavelength dependence of the effective neutron cross section for hydrogen has been investigated by measuring the transmitted total scattering cross section in urea, beta-alanine, tartaric acid and polyethylene, over the energy range 3 meV to 10 eV. Data show a linear dependence on wavelength between 0.55 and 2.0 Å, i.e. a small bandwidth compared to that used in Laue neutron diffraction experiments, for example at pulsed sources. Under the assumption that carbon, nitrogen and oxygen atoms contribute a small and invariant amount to the measured total cross section, these data represent a direct measure of the wavelength dependence of the overall scattering contribution of the hydrogen atoms to the total cross section and can be used to apply effective wavelength-dependent corrections to neutron scattering data on hydrogen-rich simple organic compounds.