

Dynamics of methyl groups: exploring rotational tunneling with the neutron backscattering spectrometer SPHERES

At the neutron backscattering spectrometer SPHERES – *SP*ectrometer for *H*igh *E*nergy *RES*olution – the high energy resolution is obtained by Bragg reflection at monochromator/analysator crystals under backscattering condition. The obtained sub- μeV resolution enables investigations on a broad range of scientific topics. Rotational motion of molecules or molecular side groups is one of the important applications of neutron backscattering. With this experiment the rotational dynamics of methyl groups in xylene shall be explored: at low temperatures reorientational motions beyond librations are possible by means of quantum mechanical tunneling.

