

Update of Neutron Science at KAERI

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Neutron scattering is a powerful probe to study the microstructure and dynamics of various materials from simple metals to proteins. Neutron diffractometer has industrial applications such as texture and formability of metallic materials and single crystal analysis. The research areas of powder diffractometer are evaluation of the quantitative phase analysis of the multi-phase alloys, magnetic and structural analysis for the development of advanced magnetic materials. A typical powder diffraction pattern obtained at a reactor source gives intensity, or number of neutrons, as a function of the scattering angle 2θ . Each peak represents neutrons that have been scattered from a particular set of atomic planes in the crystalline lattice. Cold neutrons have energies below about 5 meV which has been reduced by inelastic scattering in a cold material such as liquid hydrogen of 20 K. Such longer-wavelength neutrons have been applied to a macro molecule, protein and the various phenomena at the surface and interface. Unique 3 dimensional neutron attenuation information can be reconstructed using a neutron tomography. Reflectometer, diffractometers and imaging facility are available at KAERI.

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