

Neutron Scattering

Abstract:

Neutron scattering is utilized to understand the properties of materials on the atomic scale. The benefits of the neutron scattering are to have similar wavelengths to the spacing between atoms, similar energy to atoms, no charge to avoid strong scattering by charges to penetrate more deeply into the matter, scattered similar extent by light and heavy atoms, and suitable magnetic moment for magnetism measurement. Neutron scattering produces prominent interference and energy transfer effects because neutrons interact primarily with the nucleus, not electron cloud surrounding it in XRD. Nowadays, neutron studies of quantum materials are commonly used for the development of IT technology and superconducting materials. At cryogenic temperatures, the energy distribution of the neutrons can be shifted to the lower energy end of the spectrum. Interesting neutron scattering phenomena are also commonly discovered at low-temperature.

Customer References:

1、Barry Winn, Quantum Condensed Matter Division, Oak Ridge National Laboratory, USA: Phys. Rev. B 100, 195122 (2019); Phys. Rev. Lett. 118, 177601 (2017); [CCR-019](#) at Oak Ridge National Laboratory. Phys. Rev. B 92, 214302 (2015). [CCR-010](#) at Oak Ridge National Laboratory.

Related Products:

Thinned aluminum vacuum shrouds and radiation shields are available for a wide variety of cryocoolers. Cryostats for neutron science are available in both sample in vacuum and top loading sample in vapor varieties with temperature ranges from 1.7 - 325 K or < 3 - 800 K.



X-5 NEUTRON SCIENCE

- Provides the axial symmetry required for manipulation of small and lightweight



X-19-NO SAMPLE IN VAPOR

- Quick cooldown times
- Great for cooling samples that do not conduct

cryocoolers

- The 360° window is ideal for minimizing blind spots

Cryostat Model	Type
DMX-5	CCR

heat well

- Fast sample change

Cryostat Model	Type
DMX-19-SCC	CCR
FMX-19N	CCR
GMX-19N	CCR