

## 50 Years of Neutron Backscattering Spectroscopy



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### My Experience with Neutron Backscattering Spectrometer

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I, for the first time used a backscattering spectrometer is IRIS, at ISIS facility, UK, way back in 1990, to study quantum rotational tunnelling of  $\text{NH}_4^+$  ions in mixed ammonium metal-alkali halides, during my stay at ISIS facility. It was found that at very low concentration (c) of the  $\text{NH}_4^+$  ions behave like 'almost' free rotors. The spectra were described successfully by distribution of tunnelling lines at higher concentration.

We are the first to observe quantum rotational tunnelling in a polymer system during my stay at UPV, Sansebastian, Spain. Other than IN16, at ILL, Grenoble, by virtue of its shape of the resolution function, it could not have been possible to observe this. PVAc being glassy in nature the rotational tunnelling was seen as 'quasielastic' like at 2.4 K. The data were described by considering the distribution of tunnelling lines as obtained from the distribution of energy barriers for classical hopping at high temperature.

In recent times we have unravelled complex dynamical landscape in everyday use surfactant micelles using IRIS and TOF data. Elastic scan is one of the interesting technique to study dynamical transition. We have studied various systems using IRIS and IN16 (B) through elastic scan.

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