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# High Pressure Cell for Simultaneous Neutron Scattering and Dielectric Spectroscopy

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We present a novel experimental device to perform simultaneous incoherent quasi-elastic neutron scattering with dielectric spectroscopy at high pressures. The cell has been designed to be utilized in a temperature range of 2-315 K and for a maximum pressure of 500 MPa. High tensile aluminium alloy was selected due to its low neutron absorption and incoherent scattering cross section. In this cell, we include a new component: two metal electrodes with a cylindrical geometry that form a capacitor in order to register the dielectric properties of the system. Main components of the high pressure cell are shown in the figure below.

This setup is a unique tool for studying a variety of systems with dynamics on a large window of time scales, such as viscous liquids, polymers and proteins. By performing simultaneous dielectric and neutron spectroscopy we are able to monitor slow and fast dynamics under exactly the same environmental conditions (container, temperature and pressure).

The setup has been successfully tested for the first time at the backscattering instrument IN16b collecting dielectric spectroscopy data in parallel with both fixed window scans and full quasielastic spectra.

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