Special Issue

Future Prospects for NMR Spectroscopy: A Perspective

Message from the Guest Editors

NMR spectroscopy has become a key tool for unravelling the structures of complex molecules, spanning a wide area of applications from analytical chemistry and material science to bio-medical and neurosciences. The applications of conventional NMR techniques are limited by the low sensitivity of the conventional coil-based induction method of detection, which relies on a large ensemble of nuclear spins to accumulate a proper signal-to-noise ratio. Hence, some cutting-edge techniques for non-inductive detection, such as diamond-defect-based optical detected magnetic resonance (ODMR) and magnetic resonance force microscopy (MRFM), demonstrate routes to overcome this limit and reach the sensitivity of a single nuclear spin detection. Another approach to enhance sensitivity in NMR spectroscopy is to polarize nuclear spins with dynamic nuclear polarization (DNP) techniques, which improves the sensitivity in NMR spectra by orders of magnitude. This Special Issue reviews the current status and future perspectives of NMR spectroscopy.

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Deadline for manuscript submissions

closed (20 October 2023)

Magnetochemistry

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 4.6

mdpi.com/si/129411

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4052 Basel, Switzerland
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