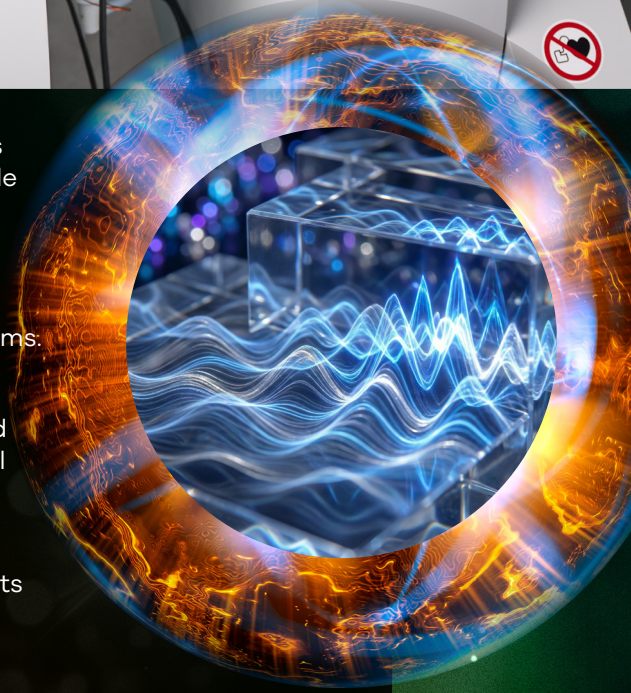
VSB TECHNICAL UNIVERSITY OF OSTRAVA | CENTRE FOR ENERGY AND ENVIRONMENTAL TECHNOLOGIES | NANOTECHNOLOGY CENTRE

Bruker ELEXSYS E500 EPR Spectrometer

Electron paramagnetic resonance (EPR, also known as electron spin resonance, ESR) is a spectroscopic method for studying compounds—synthetic or biological—that contain unpaired electrons (radicals, metal centres, spin labels, defects, etc.). The unpaired electron spins can be excited in an applied magnetic field, producing resonance signals whose features (g-values, hyperfine splitting, line widths, relaxation behaviour) report on the local electronic environment, structure, dynamics, and interactions. Because EPR is non-invasive, it is also possible to perform in situ and even in vivo measurements (e.g. sensing O_2, NO, radicals in biological systems), as well as mechanistic monitoring of radical reactions or spin probes in chemical and biochemical systems

Key Features

- **High-sensitivity X-band CW EPR spectrometer**
  Operation in the X-band microwave region (9.0–9.9 GHz) provides highly sensitive continuous-wave EPR detection suitable for a wide range of solid and liquid samples.
- **Excellent absolute sensitivity**
  An absolute sensitivity of approximately 1×10^{15} spins / (1 G √Hz) enables reliable detection of dilute or weakly paramagnetic systems.
- **Flexible magnetic field modulation and sweep range**
  Adjustable field modulation frequency from 100 Hz to 100 kHz and magnetic field sweep up to 2.0 T (20,000 G) ensure precise control across diverse experimental regimes.
- **Variable-temperature operation**
  A variable-temperature unit using nitrogen gas allows experiments over a broad temperature range of approximately 90 K to 600 K, covering cryogenic to elevated-temperature conditions.



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