



magnetech

by  Freiberg Instruments

high performance electron paramagnetic resonance spectrometer

MiniScope MS 5000

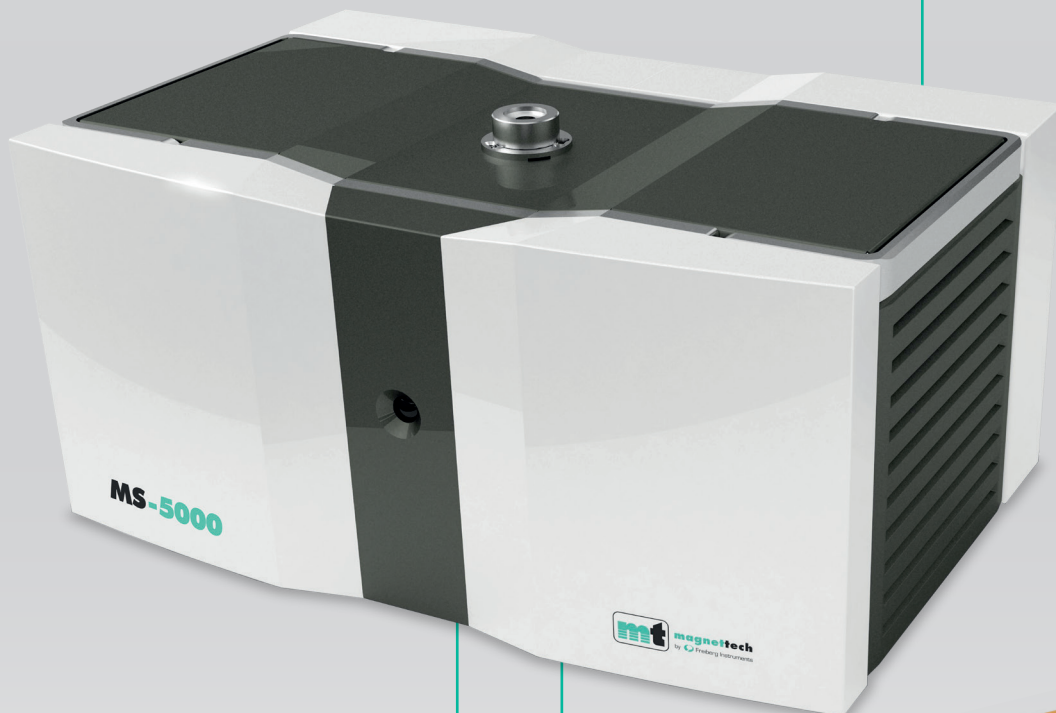
ESR spectrometer with scientific grade performance

Next generation electron spin resonance spectroscopy (ESR). Combined state of the art electronics and extended experience of magnet and resonator engineering allow for more than a factor of two improvement in signal to noise ratio.

compact size

the ideal 'everywhere' spectrometer

45 kg, 397 x 262 x 192 mm



sensitivity & stability

outstanding sensitivity and magnetic field stability, extended data detection schemes

detection limit of 10 nM in PBS

versatile options

automated goniometer for measurement of angular dependencies, low temperature measurements, big collection of specialized sample holders and glassware, comfortable software for data handling and evaluation

autosampling for liquids, powder and solid samples

Wide field of applications

Life sciences

Nitric oxide measurement, reactive oxygen species, oxidative stress, radical generating systems, photo dynamic therapy

Environmental Toxicology

Generation of radicals by particles

Biophysical Features

Oxymetry, membrane fluidity, pH in microenvironment, viscosity, phase partition

Food Chemistry and Pharmacy

Antioxidative features of foodstuff, radicals in foodstuff, radiation-induced radicals

Alanine Dosimetry

Alanine dosimetry (tablets, thin films)

Bioinorganic Chemistry

Bioinorganic transition metal compounds, fenton chemistry, effect of heavy metal ions on living tissue

Petrochemistry

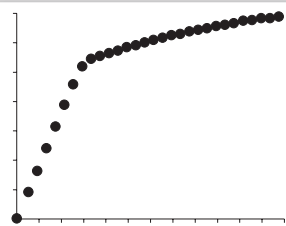
Living polymers, nitroxide quantification, radicals in varnish, UV stability of scratch resistant varnish

Separation of Radicals

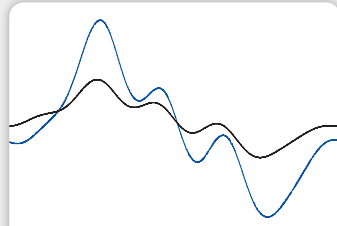
EPR/HPLC coupling

Cosmetic

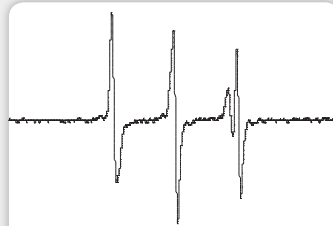
Radical protection factor, protection features of UV-filters in creme, shampoo, etc.



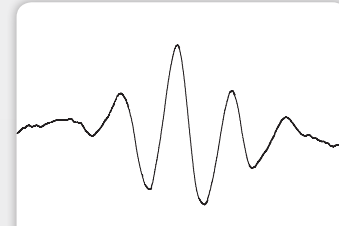
Kinetic of ROS generation by xanthine / xanthine oxidase



Basal (black) and stimulated (blue) NO generation by rat aorta



TEMPO in a two phase system oil/water



Spectrum of an Alanine tablet irradiated with 5 Gy

Technical data

Magnetic field		Microwave	
field modulation	1 μ T – 1 mT	frequency	9.2 – 9.6 GHz
modulation frequency	10 kHz and 100 kHz	power	1 μ W – 100 mW
magnetic field range	30 – 650 mT	resonator	rectangular TE102 automatic detection of Q factor wide range of coupling
field resolution	0.03 μ T	sensitivity	8×10^9 spins/0.1 mT
scan range	0 – 620 mT	repeatability	< 1.0 %
scan resolution	$\geq 250,000$ steps	case	size 397 x 262 x 192 mm
stability	1.0 μ T/h	weight	~ 45 kg
homogeneity	± 5 μ T within sample region	power consumption	~ 300 VA
sweep time	1 s – 2 h		
cooling	air if necessary (low noise)		

Customer Feedback: <0.05 %

Accessories

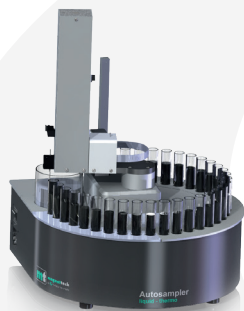
Autosampler for powder and solid samples

automated handling of up to 23 samples in quartz tubes 3–6 mm diameter, precise height positioning within resonator for highest reproducibility.



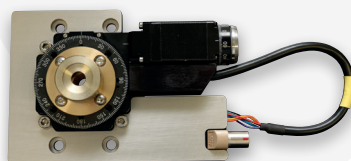
Autosampler for liquids

Automatic liquid sample transfer for spectrometers of the MiniScope series, Autosampler and integrated peristaltic pump, software controlled. Software for kinetic measurements, including automatic data acquisition and data evaluation. Single or multiple chemicals, optional: automated component mixing and temperature control.



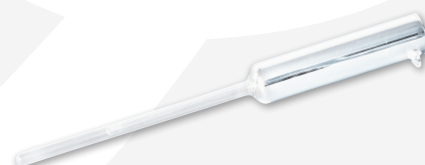
Temperature Controller – TC H04

Temperature range 93 – 473 K. Liquid nitrogen storage, measurement with cavity integrated nitrogen dewar.



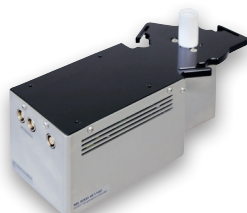
Automated Goniometer

Fully automated angular rotation of sample, step size 0,1° to 180°. Each measurement of a new spectrum starts with an automated readjustment of the spectrometer for best measurement performance.



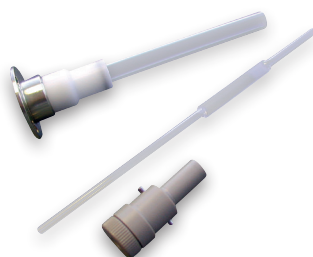
Dewars

To manually cool the samples.



Bio Temperature Controller

For temperature stabilization of biological systems like tissue samples. Temperature range: 293 – 350 K.



Glassware

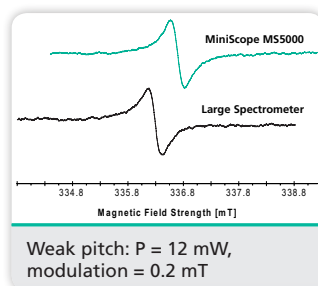
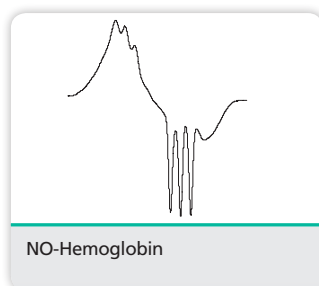
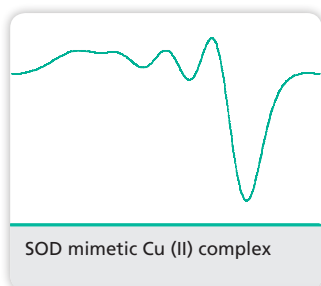
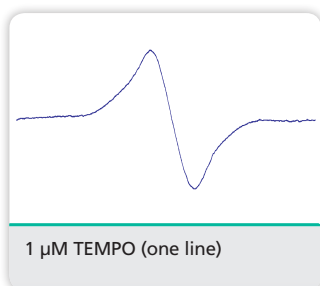
50 µl capillaries, flat cell and special holder SH-P, tissue cell, sample tubes, finger dewar, etc.



Tissue Cells

For tissue samples.

Highlights



Detection limit

10 nM in PBS

Available standards

Chromium and Manganese

Wide magnetic field range

(30 – 650 mT)

Ultra fast and stable

auto frequency control

No spikes

due to liquid nitrogen bubbles

Sensitivity of MS 5000

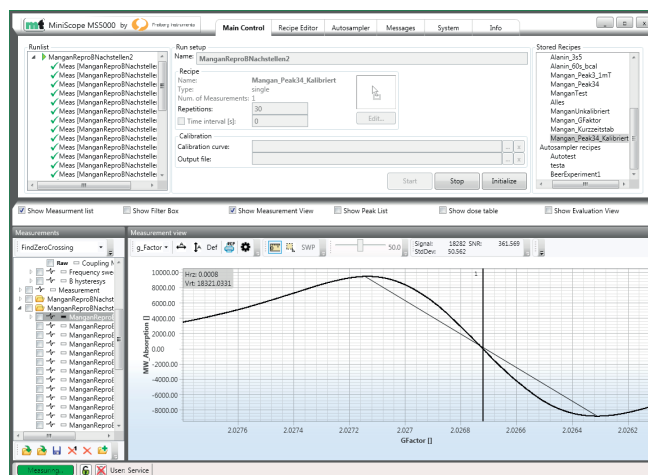
bench top spectrometer compared to large stationary spectrometer with universal TE 102 cavity

Software – ESRStudio

ESRStudio is the most modern and dynamic software for ESR measurements with convenient workflow based user interfaces.

Highlights:

- Most advanced operating and data evaluation software
- Modern and user friendly user interfaces
- User/application based customization
- Advanced scientific capability
- Work flow for automated spectrum evaluation
- Automated report generation for convenient research work
- Versatile optimization of parameters like signal amplitude, phase of magnetic field modulation etc.



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