NIUMAG
ANALYTICAL INSTRUMENT CORPORATION

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NIUMAG ANALYTICAL INSTRUMENT CORPORATION

Company Introduction

Niumag Corporation, national high-tech enterprise founded in 2003, specializes in low-field nuclear magnetic resonance and has been famaous for high-precison, state-of-the-art NMR/MRI instruments for over 14 years.

We are dedicated to constantly deliver innovative products and also the best service. Our products now are approved and adopted broadly in fields of food science, energy, polymer and life science with robust, reliable and fast technology. Our vision is to keep on developing and bringing innovative techniques to the marketplace and aim to enhance customer productivity and boarden their applications by offering the best precision along with efficiency.

History

- 2003.10 Niumag Corporation was founded in Pudong Zhang Jiang High Tech Park, Shanghai.
- 2007 Gain achievement transformation certification of Shanghai.
- 2008 Gain ISO9001 Quality System Certificate.
- 2009 Niumag was approved as High-tech enterprise.
- 2009.04 Factory was settled in Suzhou Hi-tech Industrial Development Zone.
- 2010 Gain Innovation Award for scientific instruments.
- 2011 Niumag products successfully entered the European markets .
- 2012 Products accepted by national food quality and safety inspection technology demonstration center.
- 2013 Approved by the National Key Scientific Instrument project.
- 2014 Approved by transformation of sci-tech achievement project.
- 2015 Niumag International was founded in USA.
- 2015.10 Niumag Corporation officially changed its name to Suzhou Niumag Analytical Instrument Corporation.
- 2016 Suzhou Niumag Analytical Instrument Corporation list in the National SME share transfer system.

We focus on providing you professional **low field NMR** solutions

Catalog

NMR Imaging and Analyzing System[1]

MacroMR12-150H-I/MacroMR12-110H-I

MacroMR series, latest product of Niumag, is developed for imaging and analyzing large-size samples. The modern and graceful appearance combined with sliding-style animal handling system makes users quickly be able to operate MacroMR system with optimal efficiency.

Moreover, equipped with rare earth (NdFeB) magnet material and Ø150 mm probe, MacroMR12 significantly improves the imaging resolution and can be adopted for a wide range of samples.

Application

Agriculture

Analyzing and imaging of water phase and distribution of woods

Analyzing and imaging of water phase and distribution of plant rosots and stems

Food

Analyzing and imaging of water/oil content of food (meet and fruits)

Life Science

Evaluation of contrast agents in vivo

Monitoring contrast agents delivery in vivo

Evaluation of drug treatment of cancer

Drug targeting judgment

Screening for tumor lesion location

Evaluation of nano drug-carrier in vivo

Petroleum & Energy

Porosity of porous media

Pore size distribution

Permeability

Fluid saturation

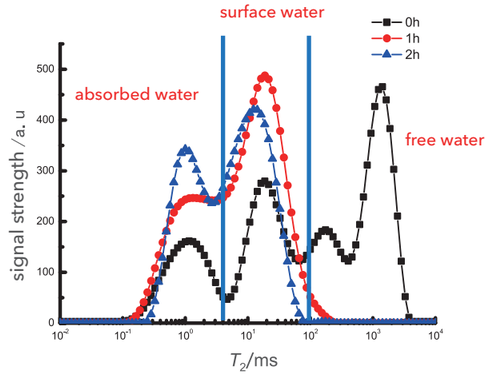
T1,T2 cutoff

Physical property evaluation of porous media

Application Examples

Agriculture

MRI in sagittal of culture media soaked in 5ml water for 2h		
culture media 1	The depth of wetting 12.05mm	The depth of wetting 12.05mm
culture media 2	The depth of wetting 12.05mm	The depth of wetting 12.05mm



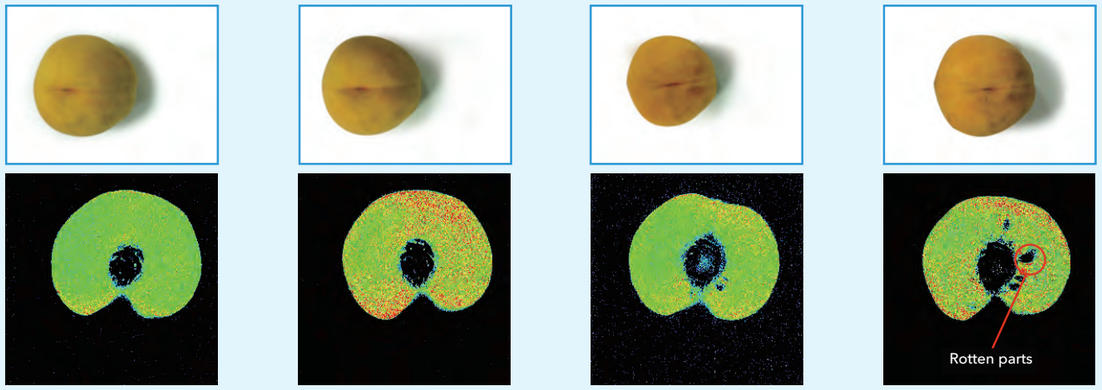
Water migration in culture media during soaking in water

1 the configuration for the same type of equipment could vary in different application fields.

Food

Investigation in quality changes of yellow peach during storage at 25 ^{0}C by NMR

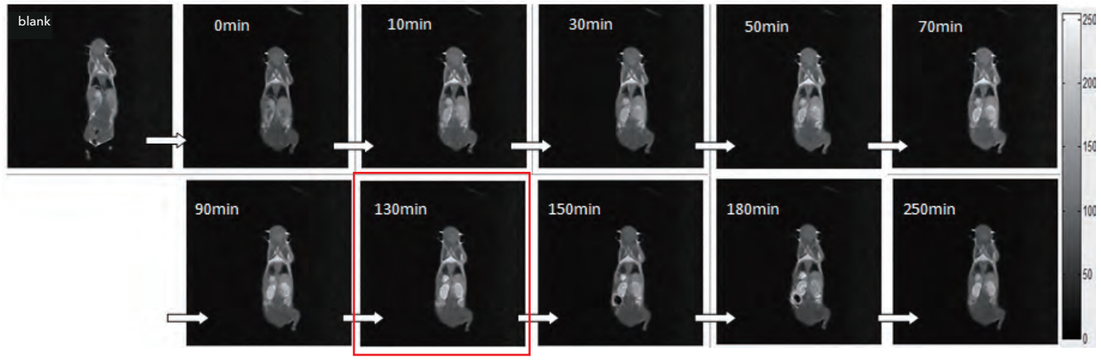
At the early stage of storage, the image of the yellow peach became brighter as it gradually softened and the mobility of its water increased due to respiratory metabolism. During the middle-period of storage, the water evaporated resulting in a weaker signal in image. At the last period, the tissue went rotten and water dissolved out from the tissus due to microbial metabolism which is the cause of the image signal changing from dark to bright again.



1day 2day 4day 6day

Life Science

Evaluation of contrast agent effectivity in rat kidneys.



The metabolism of contrast agent lasts longer than 250 min in rat kidneys, and the maximal effect reaches at 130 min after contrast agent injection.

Petroleum & Energy

Fracture identification

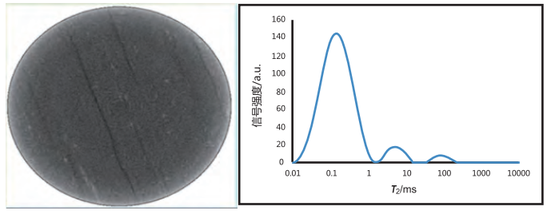


Fig1. Existence of long relaxation water fraction indicates the existence of large fractures

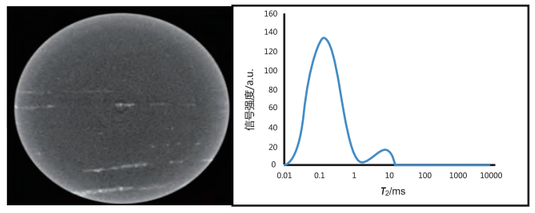


Fig2. Absence of long relaxation water indicates the only existence of small fractures

Check fracture existence based on the T2 relaxation.

NMR Imaging and Analyzing System[1]

MesoMR23-060H-I/MesoMR23-060V-I

MesoMR series is a powerful imaging and analyzing system equipped with Low-Temperature-High-Pressure System (LTHP) and High-Temperature-High-Pressure System (HTHP) which cater for the scientific work under critical temperature and pressure conditions. Therefore, it is highly recommended to be applied in food, agriculture, life science, polymer, geology and energy.

MesoMR can be combined with different magnetic field directions, temperatures, pressures and probe sizes.

MesoMR23-060H-I (horizontal)

MesoMR23-060V-I (vertical)

Features

Optional Magnetic field Direction: Horizontal and Vertical;
Easy Installation, Low Maintenance;
RF Shield Room is not necessary;
Specialized Modules: simulating various environmental conditions with integrated LTHP/HTHP systems;
Easy to use: automatically optimizing parameters and delivering fast results and imaging;
Advanced Imaging Software: providing functions including noise reduction, pseudo color, data extraction, 3D reconstruction and etc.

Application

Agriculture

- Analysis of water distribution, migration, motility in plant roots
- Analysis of water distribution in plant leaves (caused by transpiration and photosynthesis)
- Transportation and distribution of nutrients in plants during growth process.

Life Science

- Evaluation of contrast agents in vivo
- Monitoring contrast agent delivery in vivo
- Evaluation of drug treatment of cancer
- Drug targeting judgment
- Screening for tumor lesion location
- Evaluation nano drug-carrier in vivo
- Analysis of body composition of conscious small animals

Petroleum Energy

- Porosity of porous media
- Pore size distribution
- Permeability
- Fluid saturation
- T1,T2 cutoff
- Physical property evaluation for porous media

Food

- Determination of oil /moisture content
- Quantitative analysis of water phases
- Water/oil distribution, migration and motility analysis in water-oil system
- Proton/T1/T2-weighted Imaging
- Analysis of water/oil spatial distribution

1 the configuration for the same type of equipment could vary in different application fields.

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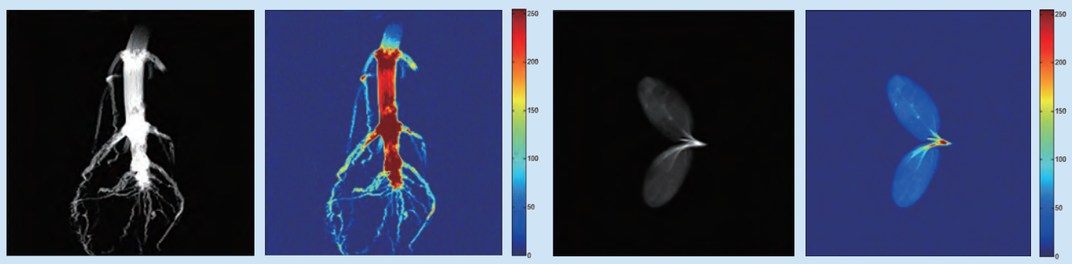
Application Examples

Agriculture

Plant MRI

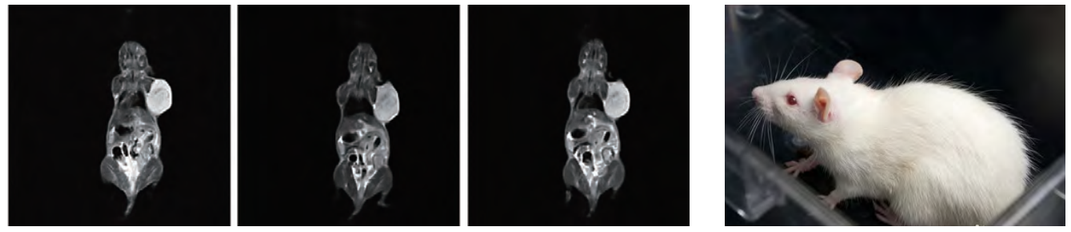


corn root MRI　　leaf MRI

As shown in the images, the gray-level expresses the signal intensity. Higher is the gray-level, the stronger is the signal. For root or leaf, the high gray-level means high content of water (specially free water). Furthermore, the images can reflect the plant growing process including respiratory metabolism, substance transportation, nutrition accumulation and so on because free water was influenced by water-soluble sugars and metabolic activity.

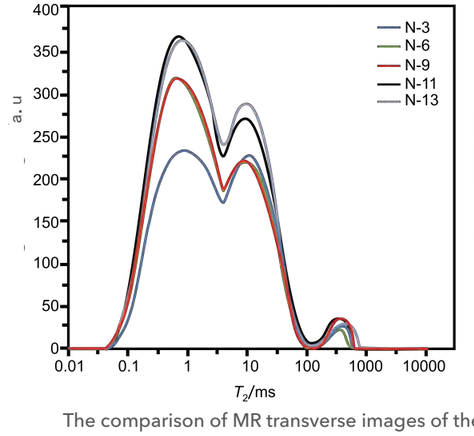
Life Science

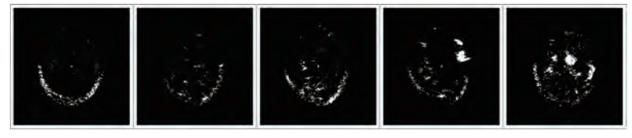
Evaluation of targeting property of contrast agent in tumor-bearing nude mice(T2-weighted)



Petroleum & Energy

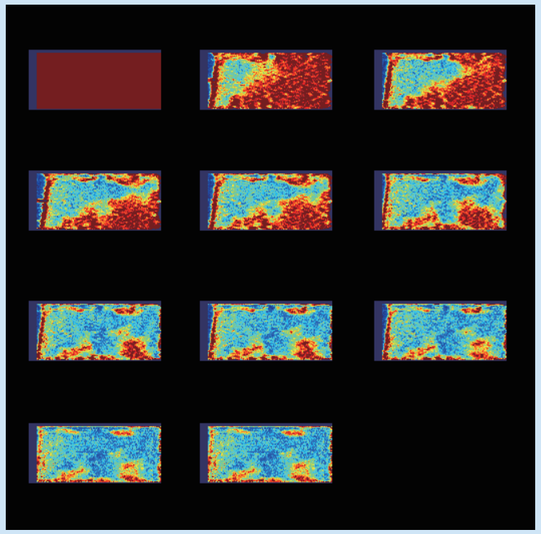
Granite freezing-thawing process





The comparison of MR transverse images of the water saturated granite under different freezing-thawing times.

Monitoring the displacement of oil using $MnCl_2$ solution by MRI (with displacement system)



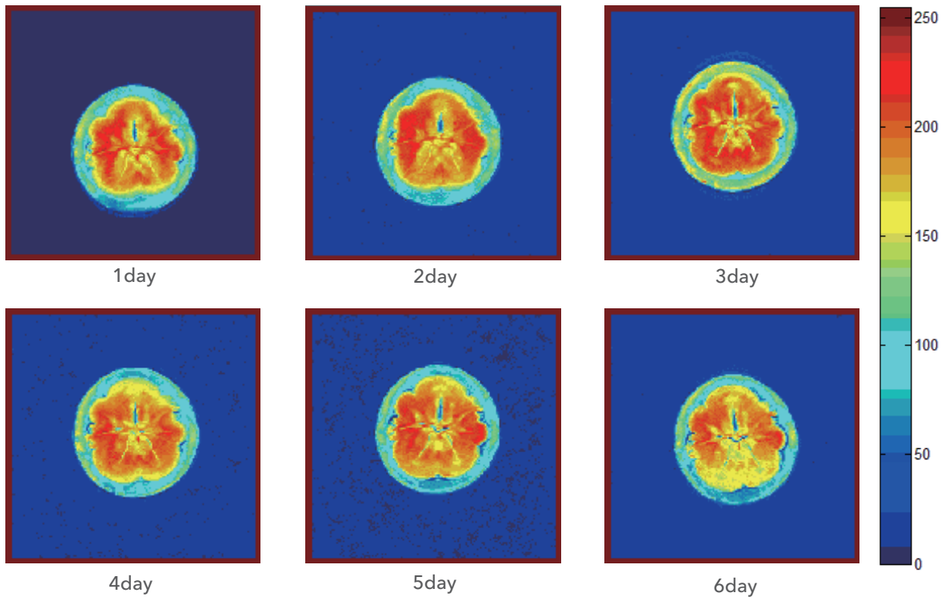
core physical property

porosity(Φ)	length(mm)	pore volume(mm)
0.240	49.0	5.77

1. Red represents for oil and green for water. ($MnCl_2$ solution)
2. The series of images expressed the whole process of displacing from 0PV (oil saturated) to 1PV (most $MnCl_2$ solution saturated). The oil-water boundary and the dominant channel can be clearly observed.
3. The residual oil saturation at different displacement stages can be obtained simutaneously.

Food

The quality change test of fruit during storage at room temperature by MRI.



The water changes of amangesteen during storage at room temperature can be visualized by time-dependent MRI. More information about the decay process can be shown if combined with NMR relaxation profile.

1 the configuration for the same type of equipment could vary in different application fields.

NMR Imaging and Analyzing System[1]

NMI20-015V-I/NMI20-025V-I

NMI20 series is a classic product that is strongly recommended. It has both imaging and analyzing functions and can be used in the field of food, agriculture and life science. The modern and fashion appearance plus high performance enable it to win Shanghai new-high-tech outcome prize and Shanghai new key product prize. NMI20 series is widely accepted by domestic and foreign experts because of its stable performance and high quality.

Application

Food

Determination of oil /moisture content
Quantitative analysis of water phases
Water/oil distribution, migration and motility analysis in water-oil system
Proton/T1/T2-weighted Imaging
Analysis of water/oil spatial distribution;

Contrast Agent

T1/T2 of contrast agent
Relaxivity of contrast agent
Contrast Agent MRI
Cell Solution MRI

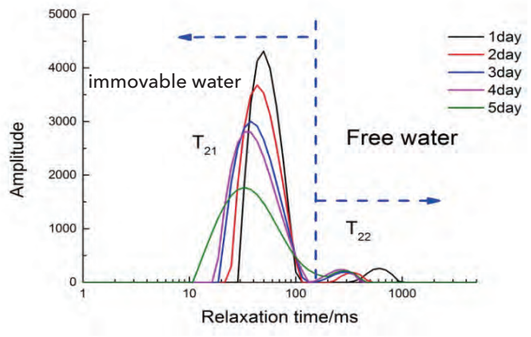
Biology

Evaluation of fermentation process of oleaginous microbe
Evaluation of DHA fermentation process
Monitoring deep processing of bio-diesel

Application Examples

Food

Water movability and quality changes of prawn during storage (T2 and MRI)



T2 distribution of prawn during storage at 4 ^{0}C

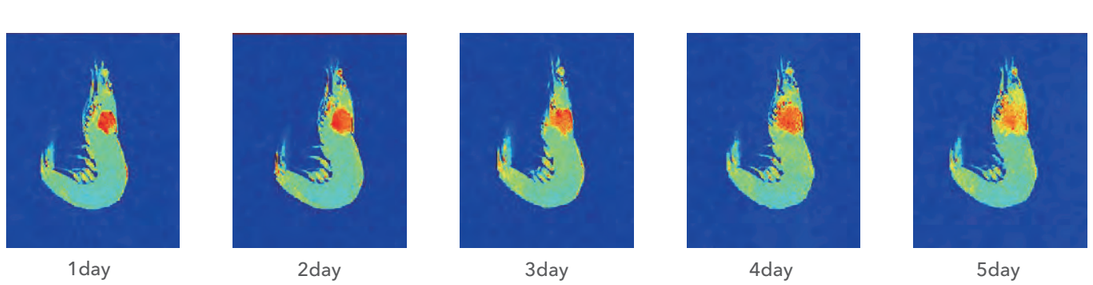
Immovable water is the water located in the grid structure of the myofibril protein (T21). Free water is the water located outside of the myofibrils (T22).

The figure indicated that the immovable water gradually shrank while the free water firstly increased and then decreased during storage at 4 ^{0}C .

The result can be explained as following:

At the first stage: the free water became less because of constant evaporation of the surface water on the prawn body.

At the last stage: the overall water-holding capacity was reduced due to the collapse of protein structure which led to the permeability alteration of muscle fiber cells and make immovable water transform to free water.

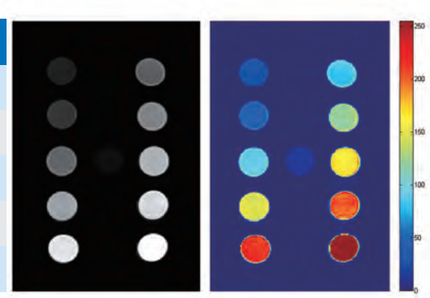


1day 2day 3day 4day 5day

Contrast Agent

Targeted Contrast agent MRI in vitro.

DTPA Group		BSA Group
0.02mmol/L		0.02mmol/L
0.05mmol/L		0.05mmol/L
0.1mmol/L	H_2O	0.1mmol/L
0.2mmol/L		0.2mmol/L
0.5mmol/L		0.5mmol/L



T1-weighted imaging of different contrast agents at the same concentration.
The images became brighter and brighter as the concentration increases.

1 the configuration for the same type of equipment could vary in different application fields.

Advanced MR Analyzing and Imaging System[1]

NM-G1-040H-I/NM-G1-060H-I

The NM-G1, small animal MRI system, is an updated MR analyzing and imaging system with high frequency. Equipped with permanent 1 Tesla magnet, it enables us to put insight into the anatomic images of mice's brain and liver with high resolution and low noise, therefore it can well satisfy the clients' diverse demands.

With Niumag's analyzing and imaging software, researchers obtain a huge range of MRI optimized methods that guarantee the fast and reliable processing it can be used in cancer research, contrast agents characterization, pharmacological research and disease mode study.

Advantages

1. Permanent 1 Tesla magnet with high magnetic field uniformity and minimal eddy current effect;
2. High resolution (< 0.08 mm) with remarkable quality in anatomy imaging;
3. Multiple sequences allow to realise full MRI capabilities;
4. Non-destructive, no risk and negligible running costs (no cryogenic gases required);
5. Powerful and user-friendly MRI Software enables users easily to learn and operate;

Applications

Cancer Research
- Screening for tumor lesion location;
- Tumor size measurement;
- Evaluation of drug treatment of cancer;

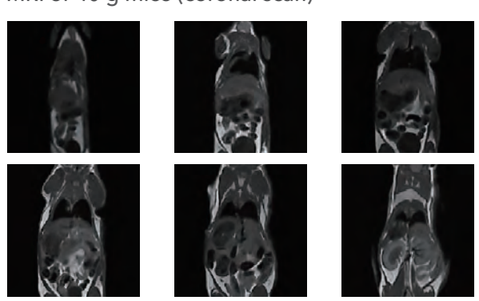
Contrast Agents (CAs) Characterization
- Relaxation analysis of T1, T2 and T1-T2;
- Evaluation of CAs imaging behavior both in vivo and in vitro;
- Monitoring metabolism of CAs in vivo;

Pharmacological Research
- Evaluation in performance and metabolism of nano-drug carrier in vivo;
- Determination of targeting property of specific agents;

Disease Mode Study
- Diabetes and Obesity;
- Cardiovascular Disease.

Application Example

Case 1: MRI of 40 g mice (coronal scan)



Conscious Animal Body Composition Analyzer[1]

MesoQMR23-060H/MesoQMR23-040H

As a quantitative NMR analyzer, MesoQMR is available for analyzing conscious animal body composition, measuring body composition such as fat, lean, free water for mice, rats, and other animals non-destructively and rapidly.

Advantages

Non-invasive: No risk to animals during the test
No anesthesia: Animals may stay conscious during the test process.
Time-saving: Lean, fat and water content of the whole body can be tested in a few minutes
Applicable to the nude mice, mice and rats： 20 g - 80 g.

Functions

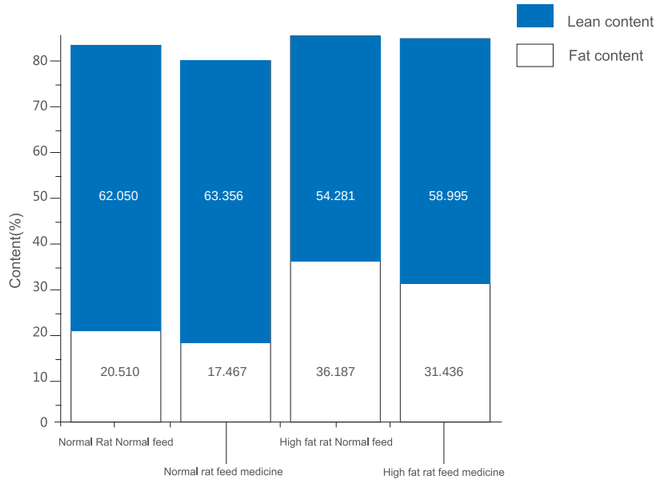
Testing fat ,lean, water content of the whole body

Applications

Obesity
Diabetes
Nutrition
Pharmacology
Osteoporosis
Cardiology research, etc.

Application Examples

Comparison of lean and fat content of conscious mice between normal group and medicated group.



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1 the configuration for the same type of equipment could vary in different application fields.

Core NMR Analyzer[1]

MicroMR02-025V/MicroMR05-025V

Functions

Specifically designed for investigating core pore structure and fluid saturation

Application Indexes

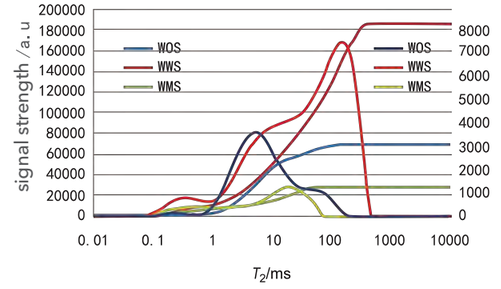
MicroMR02-025V

1. Minimum detection limit: 100 mg water;
2. Sample diameter ≤ 25.4 mm (1"), Sample height < 25 mm;
3. Test range of porosity： 0.79 % -100 %
4. Linear correlation coefficient of porosity > 0.999
5. The accuracy of core： RD < 5 %;
6. Repeatability： RSD < 3 %, reliability： RSD < 3 %

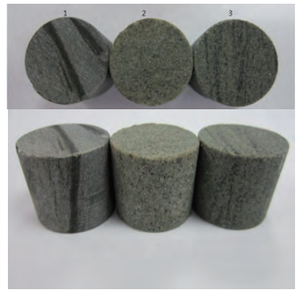
RSD: relative standard deviation
RD:relative deviation

Application Examples

1. Test of Conventional Core



Porosity: 15.20 %
BVI: 45.85 %
FFI: 54.15 %
oil saturation: 12.50 %
water saturation: 87.50 %
WOS: Original Sample
WWS: Saturated Water Sample
WMS: Saturated Manganes Sample



Calculus Spectra of Sandstone

It is obviously shown that the relaxation time of water is sharply shortened after samples were incubated in Mn^{2+} solution which caused the water signal to be restrained completely while only oil signal can be tested.
Porosity, BVI and FFI can be gained from the relaxation spectrum of saturated water sample, and the oil saturation and water saturation can also be obtained from the relaxation spectrum of the original samples and Mn-saturated samples.

Shale NMR Analyzer[1]

MicroMR12 - 025V

MicroMR12-025V Shale NMR analyzer is designed specifically for low-porosity and low-permeability cores especially shale. It can be used in exploration and development of low permeability oil field / gas field and well logging calibration.

Advantages as below: good repeatability, good reliability, high cost-performance ratio and objective results with high accuracy.

Functions

Analysis of conventional core pore structure and fluid saturation;

Analysis of unconventional core (tight core, mudstone and shale) pore structure and fluid saturation.

Application Indexes

1. Minimum detection limit: 10 mg water;
2. Sample diameter ≤ 25.4 mm (1"), Sample height ≤ 25 mm;
3. Test range of porosity: 0.79 % -100 %;
4. Linear correlation coefficient of porosity > 0.999;
5. The accuracy of core: RD < 5 %;
6. Repeatability: RSD < 3 %, reliability: RSD < 3 %.

RSD: relative standard deviation

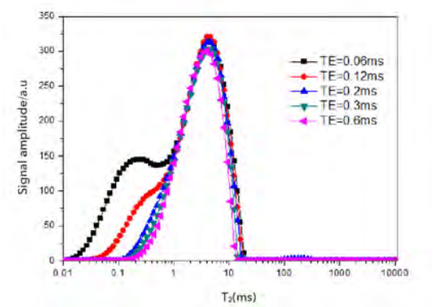
RD: relative deviation

Application Examples

1. Accuracy Test for Core Porosity

NMR method vs. Weight method				
No.	sandstone 1#	sandstone 2#	tight sandstone 1#	sandstone 2#
NMR(%)	16.83%	17.41%	1.84%	1.01%
weight(%)	17.23%	17.58%	2.55%	1.66%
AD(%)	1.54%	0.17%	0.71%	0.65%

2. Comparison of shale relaxation time with different TEs



More comprehensive relaxation information can be obtained by applying shorter TEs in the case of samples with short relaxation.

1 the configuration for the same type of equipment could vary in different application fields.

Drilling Fluid NMR Analyzer[1]

MicroMR20 - 025V

MicroMR12-025V NMR analyzer is designed especially for drilling fluid. It can measure oil and water content of the drilling fluid as well as the crude oil viscosity. It provides a new method for mud logging to analyze the drilling fluid.

Applications

- Rapid determination of oil content and moisture;
- Monitoring the water and oil content changes of drilling fluid in real-time, and reflecting stratigraphy (discovering oil layers and water layers);
- Crude oil quality analysis;
- The effects of different additives on the drilling fluid properties;
- Reservoir evaluation.

Application Indexes

1. Minimum detection limit: 5 mg of standard oil sample;
2. Sample diameter ≤ 25.4 mm (1"), Sample height < 30 mm;
3. Test range of oil content: 0.05 % - 100 %;
4. Linear correlation coefficient of oil content > 0.999;
5. Repeatability: RSD < 3 %.

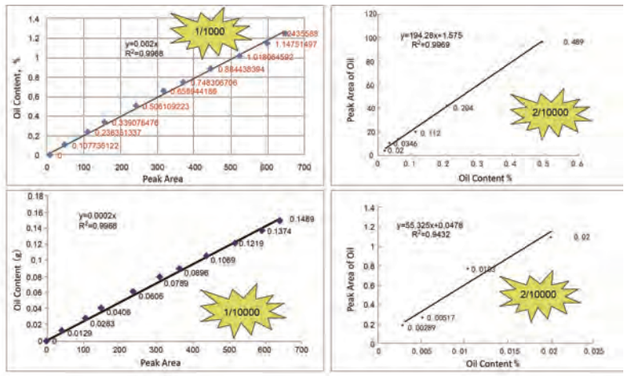
RSD: relative standard deviation

Application Examples

1. Investigation of repeatability for different samples（1 # 2 # 3 #）

Times	1#	2#	3#
1	0.511‰	0.980‰	5.023‰
2	0.498‰	0.943‰	4.970‰
3	0.499‰	0.957‰	4.922‰
4	0.461‰	0.938‰	4.979‰
5	0.506‰	0.965‰	5.015‰
6	0.506‰	0.962‰	5.063‰
7	0.513‰	0.962‰	4.974‰
8	0.511‰	0.930‰	4.995‰
9	0.494‰	1.001‰	4.966‰
10	0.499‰	0.971‰	5.108‰
11	0.501‰	0.964‰	5.005‰
Mean	0.500‰	0.961‰	5.002‰
RSD	2.862%	2.059%	1.013%

2. Results for oil content of drilling fluid



The detection limits of oil content can down to 0.01 % with the accuracy of 0.002 %.

Mobile NMR Analyzer[1]

MobileMR20-003V/MobileMR05-005S

MobileMR series is the innovative device launched in 2013 by Niumag. It possesses extremely compact size, less weight and disassembly which enables it to be applied outside testing conveniently and efficiently. MobileMR series offers two choices of operating frequency at 2 MHz and 5 MHz.

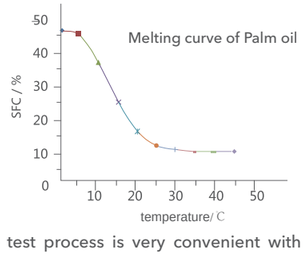
NMR Solid Fat Content Analyzer

PQ001-20-010V

The determination of solid fat content (SFC) by NMR analysis is recognized by the international standards. Niumag has been dedicated to research and develop NMR PQ001 SFC Analyzer which offers the determination of SFC values and presentation of the melting curve with non-destructive, fast and accurate measurements.

Niumag TD-NMR analysis complies with the following international standards	
ISO 8292	AOCS Cd 16b-93

Application Examples



1. The test process is very convenient with high sensitive FID signals.
2. Melting curve can be measured and crystallizing course can be monitored.

1 the configuration for the same type of equipment could vary in different application fields.

MRI Contrast Agent Analyzer

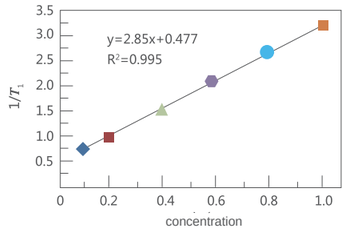
PQ001-20-010V

Features

1. Relaxation analysis of T2 and T1 for CAs (Fe^{3+}, Gd^{2+} and Mn^{2+});
2. Relaxation analysis of isolated tumor tissues;
3. Relaxation analysis of cell sap.

Application Examples

	NO.	Concentration	T_1 (ms)	$1/T_1$ (S^{-1})
Group 1	1-1	0.1	1386	0.722
	1-2	0.2	974.915	1.026
	1-3	0.4	594.885	1.681
	1-4	0.6	456.341	2.191
	1-5	0.8	351.782	2.843
	1-6	1	308.256	3.244
$r_1(Mm^{-1}\cdot S^{-1})$			2.851	



The relaxation rate increases linearly with the increasing concentrations of CAs. And the relaxivity is the slope of the linearity.

Spin Finish NMR Analyzer

PQ001-20-010V

Application Examples

1. Accuracy: error is less than 0.1 % (sample with 5 % oil content)--error is less than 0.02 % (sample with 0.5 % oil content);
2. Reproducibility: RSD < 2 %;
3. Test limit: oil content is 0.01 % in 1 g fiber.

Seed NMR Oil Content Analyzer

PQ001-12-040V

Features

Measurement of seed oil and moisture content

Application Indexes

1. Minimum detection limit: 100 mg water;
2. Sample height < 30 mm;
3. Test range of seeds oil content: 0.03 % ~100 %, Accuracy: RD < 2 % (compared with Soxhlet extraction method);
4. Repeatability: RSD < 2 %, reliability: RSD < 2 %.

RSD: relative standard deviation

RD:relative deviation

Application Examples

Oil contents in sunflower seeds -- NMR vs. Soxhler extractor				
No.	Sample 1	Sample 2	Sample 3	Sample 4
NMR (%)	45.87	46.53	45.57	45.96
Soxhler extractor (%)	46.35	46.13	46.27	46.53
RD(%)	1.04	0.87	1.51	1.23

Water contents in sunflower seeds -- NMR vs. Drying method				
No.	Sample 1	Sample 2	Sample 3	Sample 4
NMR (%)	6.41	6.37	6.6	6.42
Dying method (%)	6.68	6.51	6.41	6.51
RD(%)	4.04	2.15	2.96	1.38

Online NMR Seed Classification System

OnlineMR20-015V-S/OnlineMR20-015V-M

Features

The measurement of seed oil content and moisture(corn, peanut and soybean)

Application Indexes

Test range： oil content 0.1 % - 100 %; moisture 0.1 % - 14 %;

Classifying rate：≥ 20000 per day;

Balance precision：0.01 g.

Application Examples

Investigation of repeatability for oil content (Haploid of corn)

	# 479	# 469	# 130
1	3.70%	3.44%	2.76%
2	3.97%	3.43%	2.76%
3	3.72%	3.46%	2.76%
4	3.75%	3.48%	2.80%
5	3.63%	3.43%	2.84%
6	3.64%	3.33%	2.79%
7	3.71%	3.35%	2.70%
8	3.63%	3.20%	2.69%
9	3.68%	3.49%	2.71%
10	3.72%	3.23%	2.80%
11	3.66%	3.39%	2.65%
mean	3.71%	3.38%	2.75%
max	3.97%	3.49%	2.84%
min	3.63%	3.20%	2.65%
max-min	0.34%	0.30%	0.19%
RSD	2.59%	2.90%	2.05%

OnlineMR offers an alternative to the traditional method of analyzing and screening large quantities of seeds. Instead of the tedious manual operations in the screening process, OnlineMR provides quick automatic online sorting function, and greatly improves the accuracy of screening seeds.

As the first online NMR-based sorting device in the world, OnlineMR can also be used for automatic intelligent sorting of other oil containing materials, with speed, high accuracy, large-scale, high-efficiency and other advantages.

NMR Crosslink Density Analyzer

VTMR20-010V-T+/VTMR20-010V-T

Functions

1. Rapid cross-link density determination of rubbers and other polymers;
2. Relaxation analysis of T2*,T2 and T1;
3. Determination of glass transition temperature;
4. Quantitative analysis of water phase with varying -temperature.

Applications Indexes

1. Minimum detection limit: 10 mg of water;
2. Test range of moisture: 0.88 % - 100 %;
3. The sample temperature range: 35 ^{0}C - 150 ^{0}C(standard)/ 35 ^{0}C - 200^{0}C (advanced), with precision ± 0.3 ^{0}C;
4. The correlation coefficient of crosslink density between NMR method and swelling method > 0.99;
5. Repeatability: RSD < 2%, reliability: RSD < 10 %.

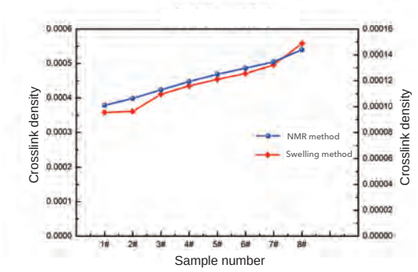
RSD: relative standard deviation

Application Direction

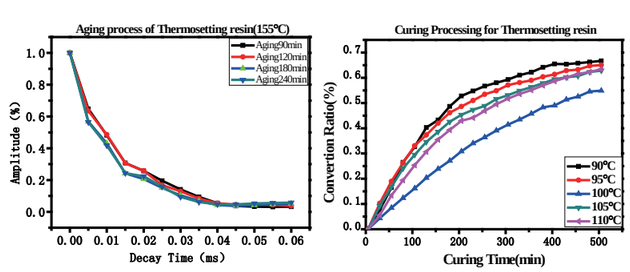
- Determination of cross-link density of polymers (especially rubbers);
- Quality control and assurance in plolymer production;
- Quality inspection in polymer aging process;
- Study in rubber vulcanization process and optimization of production conditions;
- Research on molecular mobility of solids, semi-rigid polymers, gels, emulsions and liquids;
- Imaging and determining the moisture in solid matrix;
- Detection of viscosity, state and process during the epoxy resin and rubber vulcanizing;
- Investigation in adhesion and activity of water of the samples;
- Determination of plasticizer or rubber content of the polymers;
- Determination of rubber content of the copolymer or blends;
- Determination of relative content of copolymers;
- Determination of solid content in rubber latex;
- Research on critical water and hydration;
- Rheological research on viscosity, density and the stability of materials .

Application Examples

NMR method vs. Swelling method



Characterization of curing and aging process for Thermosetting resin



1 the configuration for the same type of equipment could vary in different application fields.

Cryogenic Nanopore NMR Analyzer

NMRC12-010V/NMRC12-010V+

NMRC12 series is a NMR-based nano-pore analyzer used to study the pore structure and distribution of porous materials. The determination of pore distribution can be measured and calculated by applying the relationship between the pore size and the freezing point of pore fluid. This NMR technique could be used to monitor the phase transition in pore fluid in real time and the detection range of pore size falls in 2 to 500 nm if appropriate fluid samples are chosen.

Application Indexes

Temperature range: - 30 ^{0}C~ 40 ^{0}C/ - 50 ^{0}C~ 40 ^{0}C (accuracy: ± 0.01 ^{0}C);
Cooling rate: 1^{0}C / min;
Sample volume: 0.5 cm^3 ~ 1 cm^3;
Pore size: 2 nm ~ 500 nm.

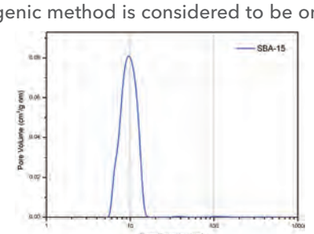
Product Advantages

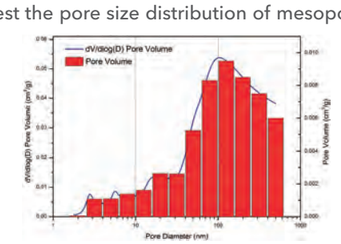
- Static fluid in pores improves the accuracy and resolution during the measuring course of cryogenic NMR method;
- The modular gas supply system provides a stable and dry air flow as the media, which reduces signal minimum and can work for a long period of time;
- Ultra-low temperature thermostat system at - 60 ^{0}C gurantees a stable cooling source which can cool down the air flow quickly and stablize it;
- Two-stage heating resistors heat the sample chamber rapidly and control the temperature precisely;
- NMR system with mature technology and full NMR capabilities: stable magnetic field, short dead time, and high SNR;
- Probe designed for low temperature isolates the heat exchanges between sample chamber and the magnet effectively;
- The powerful software with friendly user interface offers a fully automated solution including calculation, temperature setting, sampling, and data process plus figure exporting.

Application Examples

1.Porous Silica

Silica-based porous material has many industrial functions such as adsorption, filtration, extraction, catalysis and so on. NMR cryogenic method is considered to be one of to be the most effective way to test the pore size distribution of mesoporous





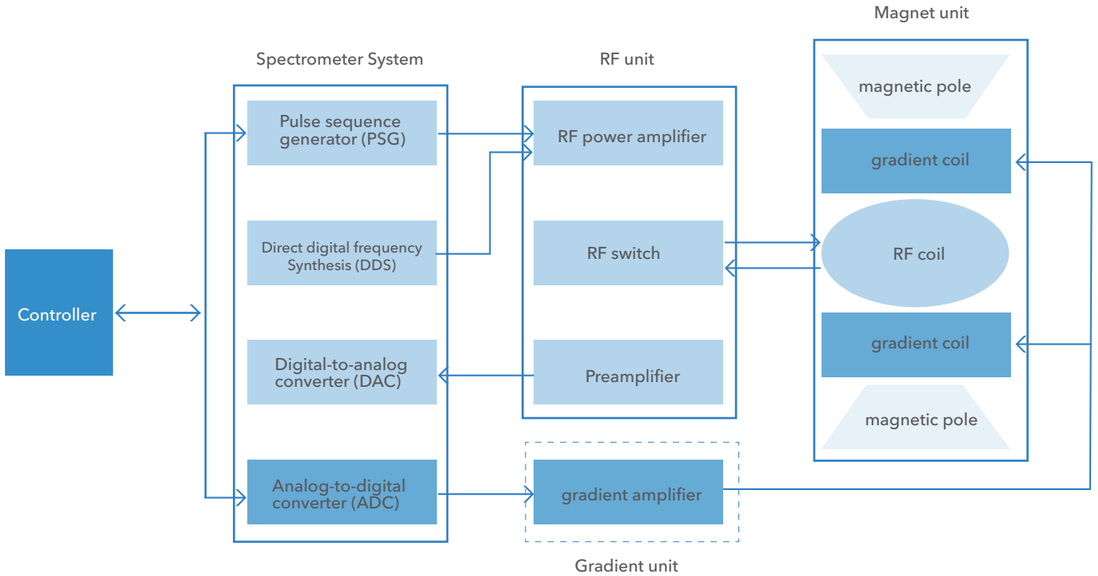
Education NMR & MRI Analyzer

EduMR20-015V-I

EDUMR is a desktop NMR device designed for MRI experimental teaching. Courses to teach NMR principles and experiments through MRI demonstration can be created by including EDUMR in physical corresponding majors (modern physics, applied physics, radio physics, electronic engineering, etc.) or medical corresponding majors (large-scale medical apparatus, medical imaging technology, biomedical engineering, etc.). Extensive experimental courses and majors like NMR engineering related to hardware structure can also be established with the use of EDUMR.

The EDUMR series products truly take the demands of teaching experiment into consideration. It is an experimental instrument developed to facilitate modern methods of education.

Structure



Virtual MRI Data Acquisition and Image Reconstruction Software

EDUVMR

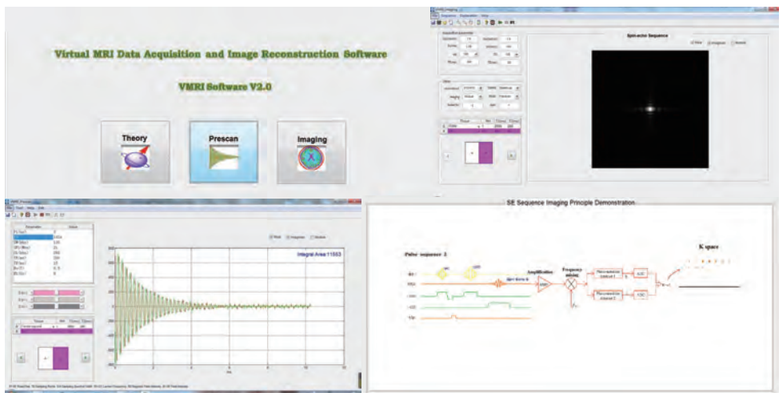
The EDUMR virtual data acquisition and image reconstruction teaching software is a low-field magnetic resonance analyzing and imaging simulation system combining NMR and MRI all in one. By using this virtual NMR signal acquisition and image processing software, we can easily build up a teaching platform, and the realistic teaching of NMR principles and techniques become much more achievable.

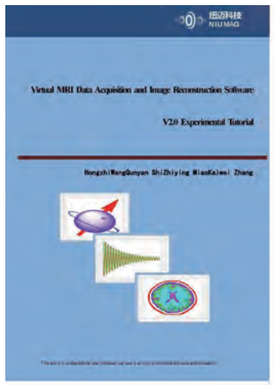
The virtual magnetic resonance imaging system can simulate the entire process. With the parameter driven interface users can select imaging sequence, the original level and imaging technology, carry out the relevant data collection process and perform K space filling of reconstructed images. The use of virtual systems allows many students to learn simultaneously without the need to invest in expensive hardware or several supervisors to train users.

Advantages

With the Virtual teaching software, users can achieve, but not limited to the following:

- ☑ Perform virtual sequence selection, parameter adjustment, data acquisition, K space filling, image reconstruction function;
- ☑ The influence of magnetic field inhomogeneity and electronic noise can be simulated;
- ☑ Minimal investment in hardware is an advantage;
- ☑ Perform fat suppression imaging;
- ☑ Perform water suppression imaging;
- ☑ Perform Bounce-point Imaging;
- ☑ Perform Half-Fourier scanning &Imaging;
- ☑ Overcomes the problem of long time of acquisition through inadequate instrumentation;
- ☑ More than four pulse sequences (SE sequence), FSE sequence, IR sequence, GRE sequence) can be used for virtual imaging data collection;
- ☑ Observe how the scan parameters affect the image;
- ☑ Minimize the impact of gradient eddy current, analog acquisition in severe T2-weighted images;
- ☑ Adjust the data acquisition to a normal speed and a very-fast speed.





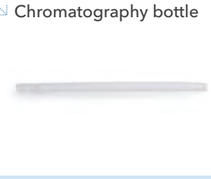
Accessory

Mouse Cage

Animal Bed

Sample Compaction

Chromatography bottle



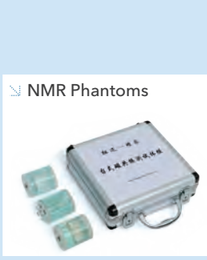
Displacing System

Standard Samples

Probes

High-Temperature
High-Pressure Holder

NMR Phantoms



Vacuum Saturation Device

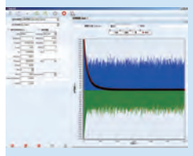
Software

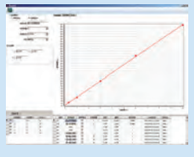
General Software

Niumag NMR Analysis software (Ver3.03)

Specialized Software

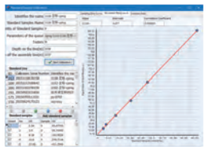
Niumag Core NMR Analysis software(Ver3.0)

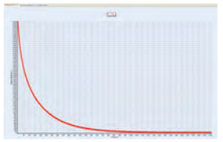


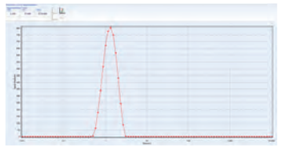


Core NMR Analysis Software is applied in porosity, permeability, saturation measurement of porous media such cores, concretes which are used for oil exploration analysis. The measuring process is very simple only including three steps: parameter setting, calibration and measurement.

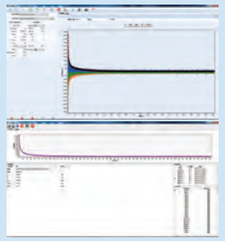
Niumag Drilling Fluid NMR Analysis Software (Ver3.0)







Niumag Cross-link Density NMR Analyzing System (Ver1.0)

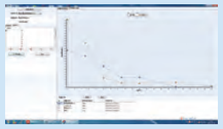


The software is designed specially for rubber analysis. It can analyze the cross-link density changes which are caused by aging, irradiating or abrading. Compared with conventional equilibrium swelling method, it is faster and more repeatable. Four types of models in the software can satisfy most of the rubber analysis and the software is very easy to use.

Niumag Contrast Agent NMR Relaxation Analysis Software

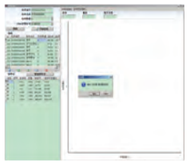
Contrast Agent Analysis Software is applied for T1/T2 and relaxivity test of CA. The user interface is designed specially for CA research such as Gd, Fe3O4 and so on.

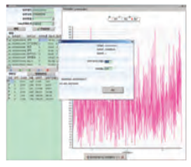
Niumag Solid Fat Content NMR Analysis Software(Ver2.0)

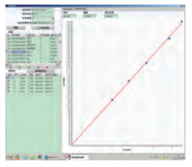


Niumag Spin Finish NMR Analysis Software(Ver2.0)

The software is designed specially for spin finish test. The operation is very easy and you can grasp the skill very quickly without any special training. There are four main functions: calibration, test, enquiry and parameter setting. You can finish parameter setting, calibration and testing with pushing buttons and export the data you need to excel format very easily.







Niumag Fat & Lean & Fluid NMR Analyzing SystemVer1.0