

Analytical Instrument Corporation



LABS / PRODUCTS / APPLICATIONS / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

Magnetic Resonance Imaging Instruments:

1 Tesla MRI Instrument

AT-NMR-3040H/ AT-NMR-3060H

The AT-NMR-AT-G1 is our highest field MRI available and accommodates 40 and 60 mm coil sizes. The 1 T field improves resolution and sensitivity to fully characterize healthy and diseased states of the major organs. Analytical Technologies Limited's analyzing and imaging software enable researchers to obtain a larger range of MRI images faster and more reliably. The hardware/software solution is rugged and durable, permitting novice users to acquire images using the most advanced protocols.

Advantages

1. High resolution ($< 80 \mu\text{m}$) gives remarkable image quality
2. 1 T magnetic field with high homogeneity and minimal eddy currents
3. Permanent magnet means no maintenance costs, no cryogenics, no liquid helium required
4. Multiple protocols, SE, FSE, GE, and more.
5. Small chassis means installation can be close to laboratory facilities where it is needed

Applications

- Tumor Screening and sizing
- In vivo drug treatment evaluation
- Relaxation analysis
- Modeling of contrast agent specificity
- Diabetes and obesity studies
- Vascular evaluation

Application Example

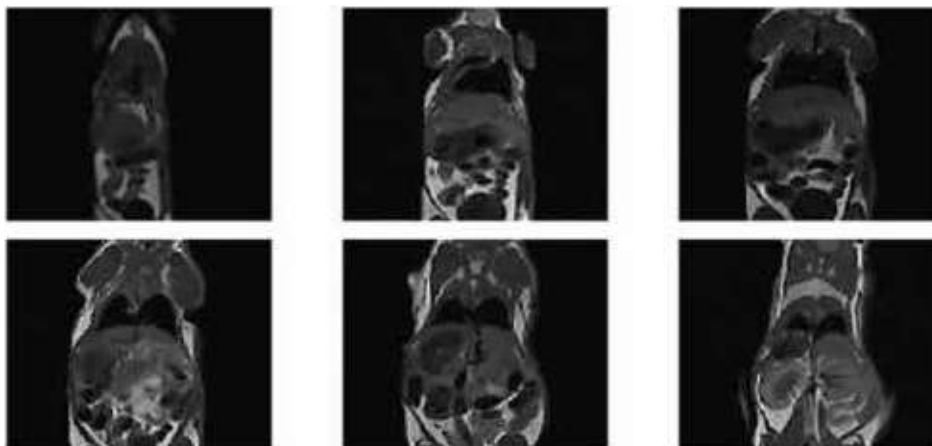
Case 1: MRI of 40g mice (coronal scan)

Configuration

- Magnetic field strength: $1.0 \pm 0.05\text{T}$
- Probe size: $\text{Ø } 40\text{mm}$
- Weight: 1.1 tons (Magnet 1.0 tons, Control cabinet 0.1 tons)
- Footprint: $1800\text{mm} \times 800\text{mm} \times 1200\text{mm}$



AT-NMR-AT1-3040H-I



The software of the AT-NMR can acquire image data with higher resolution and more quickly than our previous mode.

MacroMR Instrument:

AT-MAC-3150H

The AT series was developed for imaging of large samples. The AT12 features an open design to accommodate large samples and is a revolutionary pre-clinical MRI system at an unbeatable price point. The AT12 is based on a permanent magnet and therefore requires no liquid helium or nitrogen and has no maintenance requirements. The 0.3T permanent magnet has very little fringe field so it can be installed into virtually any environment. The open design allows users to load their samples quickly and easily. The large probe size accommodates many variations of sample introduction such as flow-through tubing for flow-imaging and pressurized and elevated temperature sample holders for petrophysical applications. Additional magnets are available for prepolarization schemes to enhance the signal of flowing media.

Application Areas:

Agriculture

- Plant and soil water distribution and sequestration.

Food

- Moisture and fat content and distribution in foods and food raw materials.
- Characterization of flow properties of foods under processing conditions.

Life Science

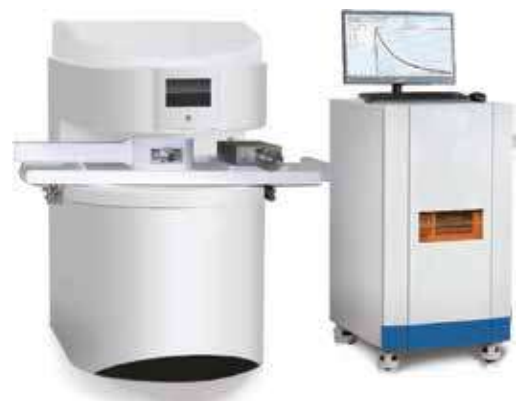
- Evaluation of contrast agents for in vivo monitoring of intravenous treatments and in vivo localization and evaluation of tumors.

Petrophysical

Porosity, permeability and pore size distribution of core samples. Simulation of down-hole conditions and volume selection using 3D gradients. Imaging of porous media under reservoir conditions of temperature and pressure and imaging under conditions of core flooding of oil, water and gas.

Configuration

Magnetic field strength:	0.3 ±0.05T
Probe size:	ø 150mm
Effective detection area:	ø150mmxH100mm
Operating Conditions:	Power supply: 220V, 50Hz Temperature: 22-28°C Humidity: 30-70%
Weight:	2.4 tons(Magnet 2.3 tons, Control cabinet 0.1 tons)
Footprint:	3300mmx1400mmx1350mm (Magnet, RF cabinet, Grad)



AT-MAC-3150H

Application Examples:

Porous Media

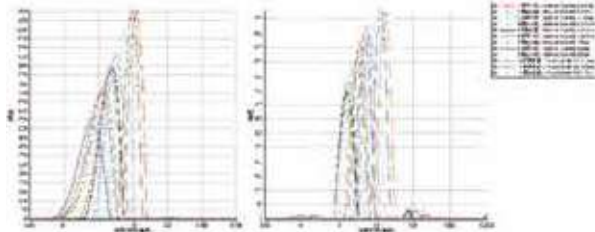


Figure 2. T_1 and T_2 spectrum of cement MK 100 during solidification over time

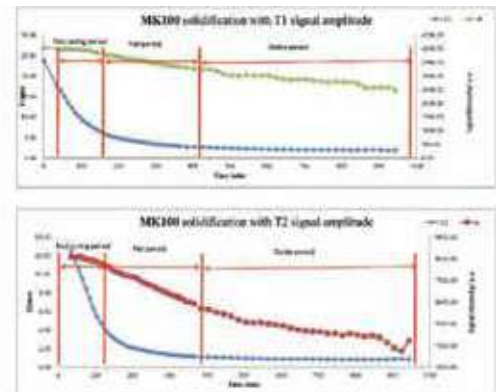


Figure 3. Relationship between T_1 & T_2 time and signal intensity of cement MK 100 over time

ATL can also be used in porous media analysis like cement, ceramic and so on. Figure-2 shows the T_1 and T_2 spectrum of cement MK100 during solidification over time. In the solidification, peaks move left and trend down. In Figure3, the whole solidification is divided into three periods. Signal intensity drops quickly in the first 120 minutes and head to flat period while the dropping trend is slowing down from 120 minutes to 400 minutes. After 400 minutes, the solidification of cement is almost completed according to the stable period of the signal intensity.

Food

During the early stage (day 1 to 2) the image becomes brighter as the fruit ripens. The increase in brightness owes to the increase in water mobility which comes from maturation. The water distribution equilibrates throughout the fruit giving an increase in overall signal intensity by day 4. The increase in free water distribution hastens the maturation process and promotes regions of decay show in the day 6 image.

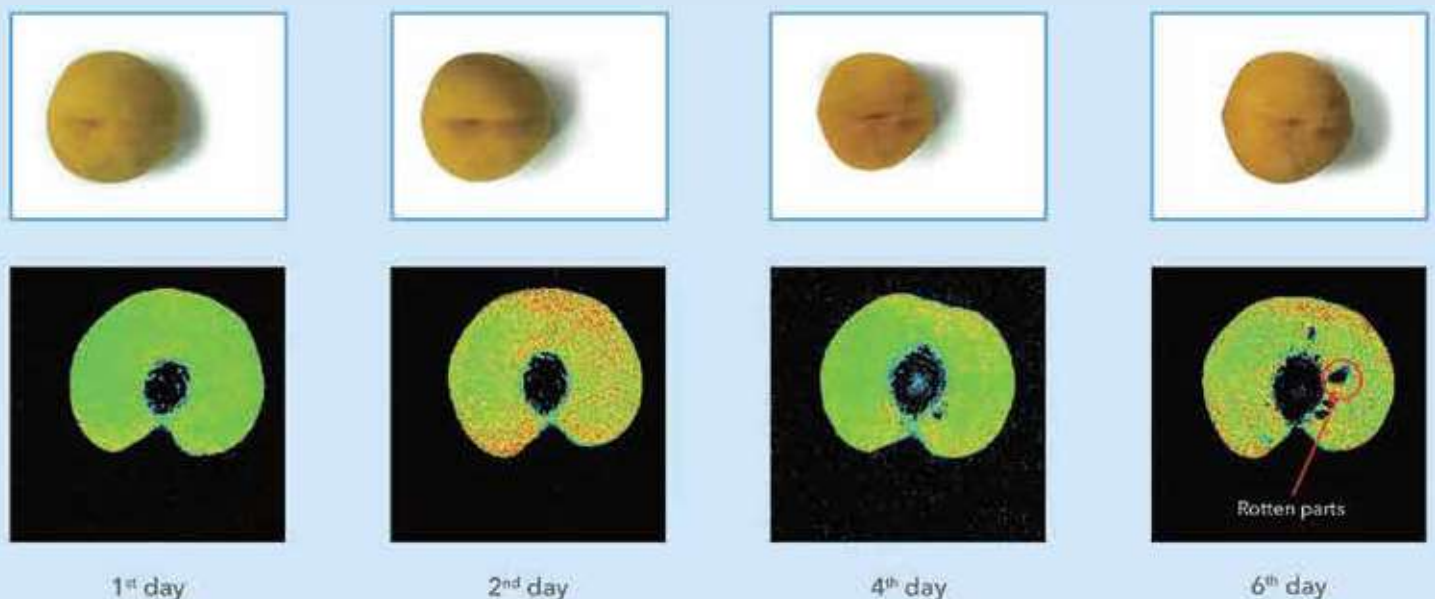


Figure 4. MRI monitoring fruit quality of a stored at 25°C

Life Science:

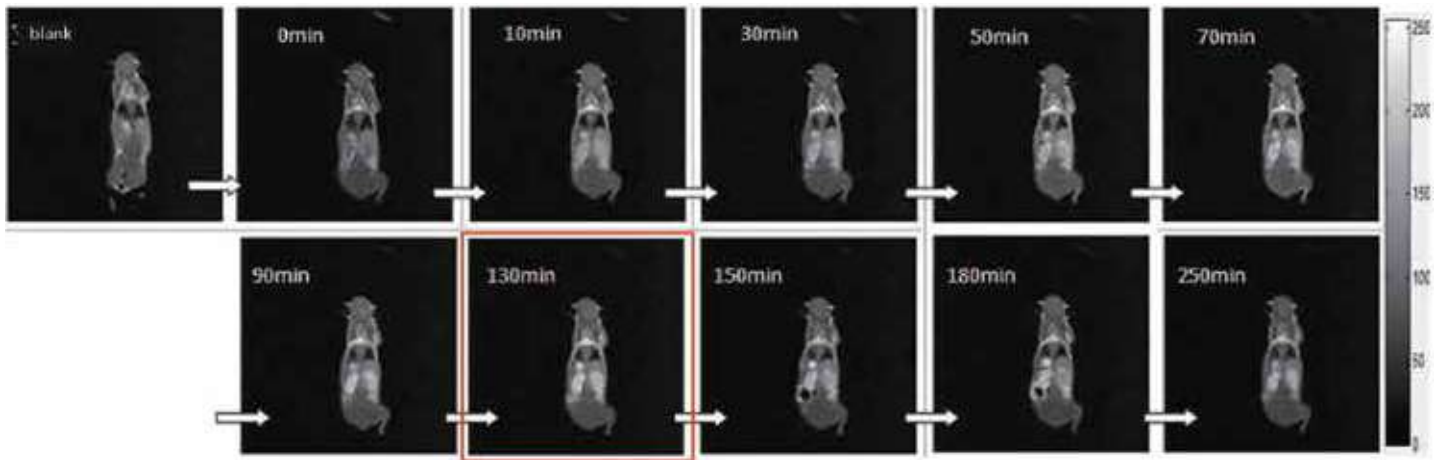


Figure 5. Contrast Agent Metabolism in Rat Liver

Evaluation of contrast agent metabolism in rat kidney. These images demonstrate that the maximum effect of the contrast agent is 130 minutes, whereas the lifetime of contrast agent is longer than 250 minutes.

Petrophysical

Fracture identification in core samples by T_2 relaxation

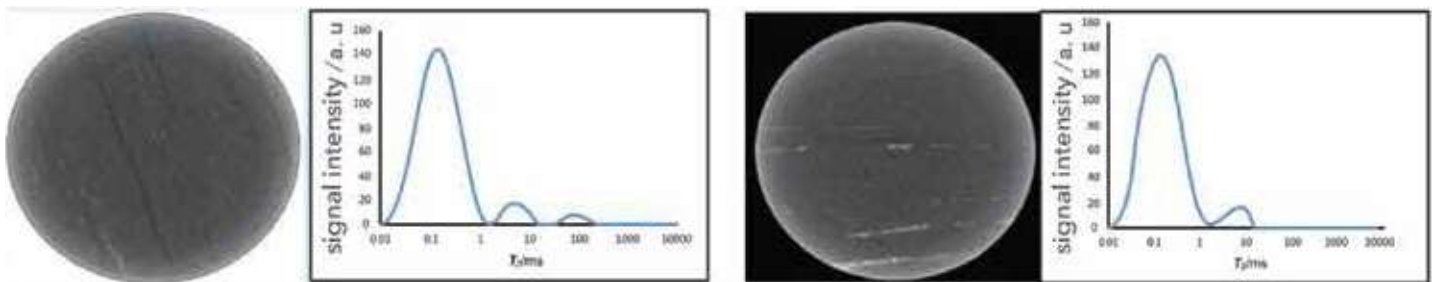


Figure 6. Existence of long relaxation water fraction indicates the existence of large fractures

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

In Figure 6, the small peak present at 100 ms indicates a large fracture in the core sample, whereas Figure 7 has only short time relaxation component indicating either small scale fractures or no fractures at all.

NMR Imaging And Analyzing System:

AT-MESO-3060H/AT-MESO-3060V

The AT - 3060H 0.5 T MRI is a widely used in many application areas. The 0.5 T field strength provides excellent sensitivity for a permanent magnet based MRI system used in the laboratory or pre-clinical environments. The AT-3060H is offered in both horizontal or vertical orientations to meet the research needs of different laboratories. The AT - 3060H can accommodate a probe size up to 60mm bore for small animals. The through-hole design also allows the AT-3060H to accommodate pressure/temperature /flow cells to study rock cores under reservoir conditions or allow for a continuous flow of material to study flow properties.



AT-MESO-3060H-I(Horizontal)



AT-MESO-3060V-I(Vertical)

Features

- Magnet Orientation: Horizontal or Vertical
- Rugged Design; Simplified Installation
- Intuitive Software; Obtain results quickly
- Robust Software: Easy to use by students
- Multiple Imaging Protocols: Address the needs of more researchers

Applicaton Agriculture

- Water distribution, migration, motility in plants
- Transportation and distribution of nutrients in plants during growth processes.
- Maturation of plants and fruit

Life Science

- In vivo evaluation of contrast agents
- Evaluation of cancer treatments
- Drug target evaluation
- Tumor screening
- Body composition(fat/lean) of small animals

Configuration

- Magnetic field strength: 0.52 ± 0.05 T
- Probe size: \varnothing 60 mm
- Weight: 0.8 tons(Magnet 0.7 tons, Control cabinet 100kg)
- Footprint: 1540mmx800mm x1200mm

Petrophysical

- Porosity of porous media
- Pore size distribution
- Permeability
- Fluid saturation
- Physical property evaluation for porous media

Food

- Oil /moisture content
- Quantitative analysis of free & bound water
- Water/oil distribution, migration and motility analysis
- Fluid flow analysis using MRI
- Spatially selective T_1 & T_2 Imaging

Application Examples:

Agriculture

Plant MRI Studies

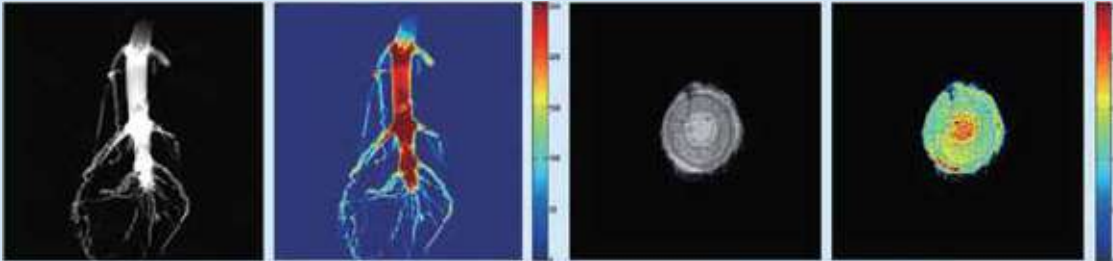


Figure 8.Corn root MRI

Figure 9.Poplar branch 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 and poplar branch, the high gray-level means the high content of water (especially free water). Furthermore, the images can reflect the plant growing process including respiration, substance transport, and nutrition accumulation, among others. Free water was influenced by water-soluble sugars and metabolic activity.

Life Science

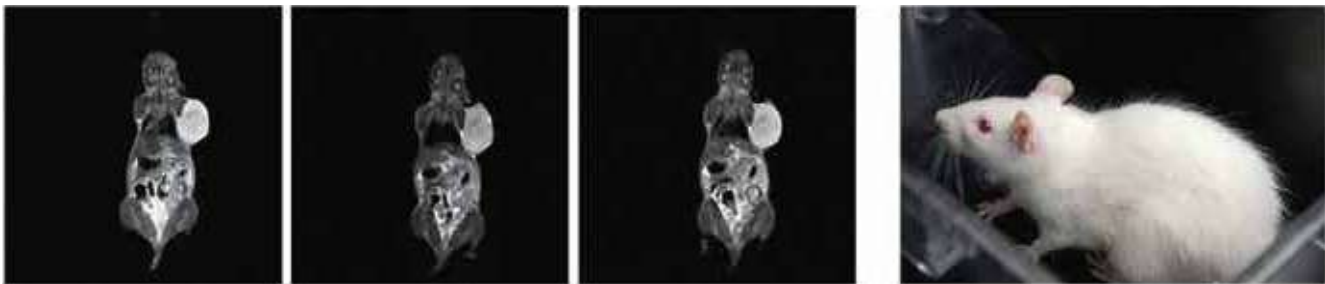


Figure 10.Evaluation of trageting property of contrast agent in tumor-bearing nude mice(T2 -weighted image)

Petrophysical

Granite freezing-thwing process

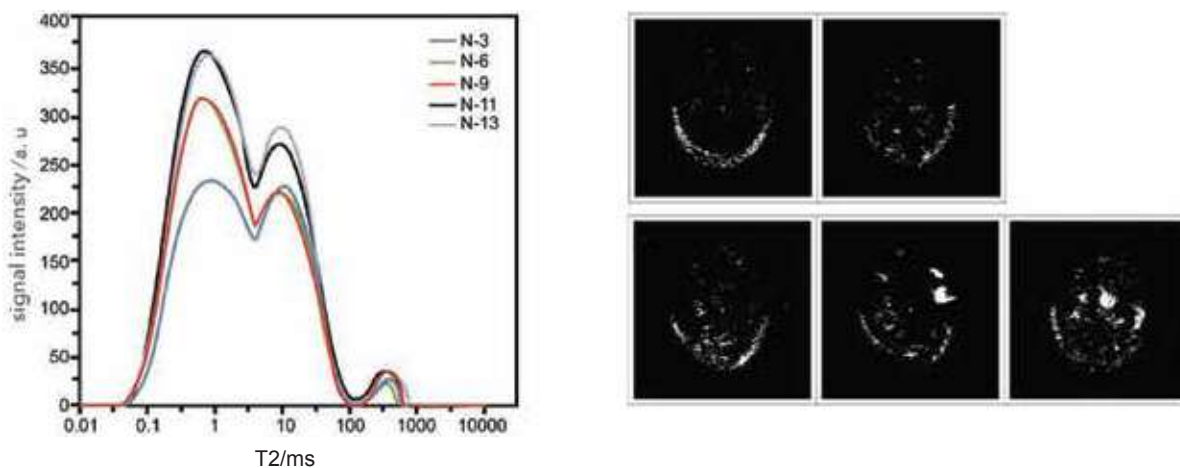
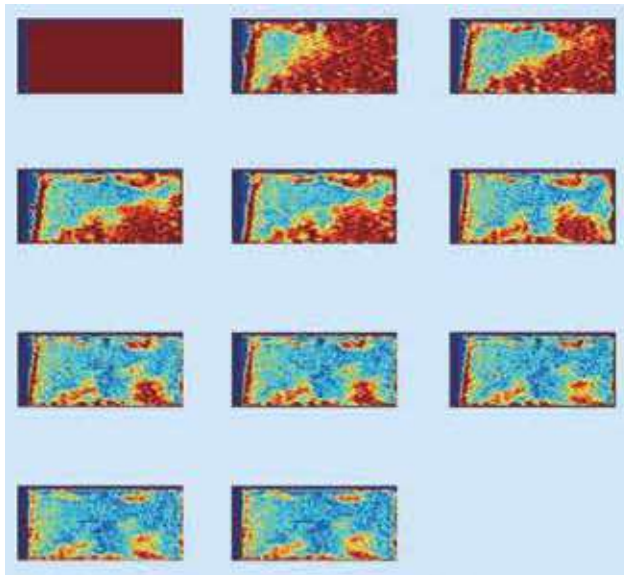


Figure 11. The comparison of MR transverse images of the water saturated granite under different freezing thawing times

Granite is first saturated with water and measured by NMR under different freezing-thawing times. The signal intensity implies the amount of cracks and pores in the granite. With the increase of freezing-thawing times, cracks grow in the granite with can be easily told by the rise of signal intensity and white area in the figure 11.



1. Fluid from oil is coded as red whereas fluid from aqueous MnCl₂ appear blue-green. (MnCl₂ solution)
2. The images depict the entire process of water displacing oil and the relevant boundaries/barriers and channels.
3. The flow is quantified based on the discrimination of the oil phase and the aqueous phase and other factors such as flow pressure and the overburden pressure.

Figure 12. Monitoring the displacement of oil using aqueous MnCl₂ by MRI (with core flooding system)

Food

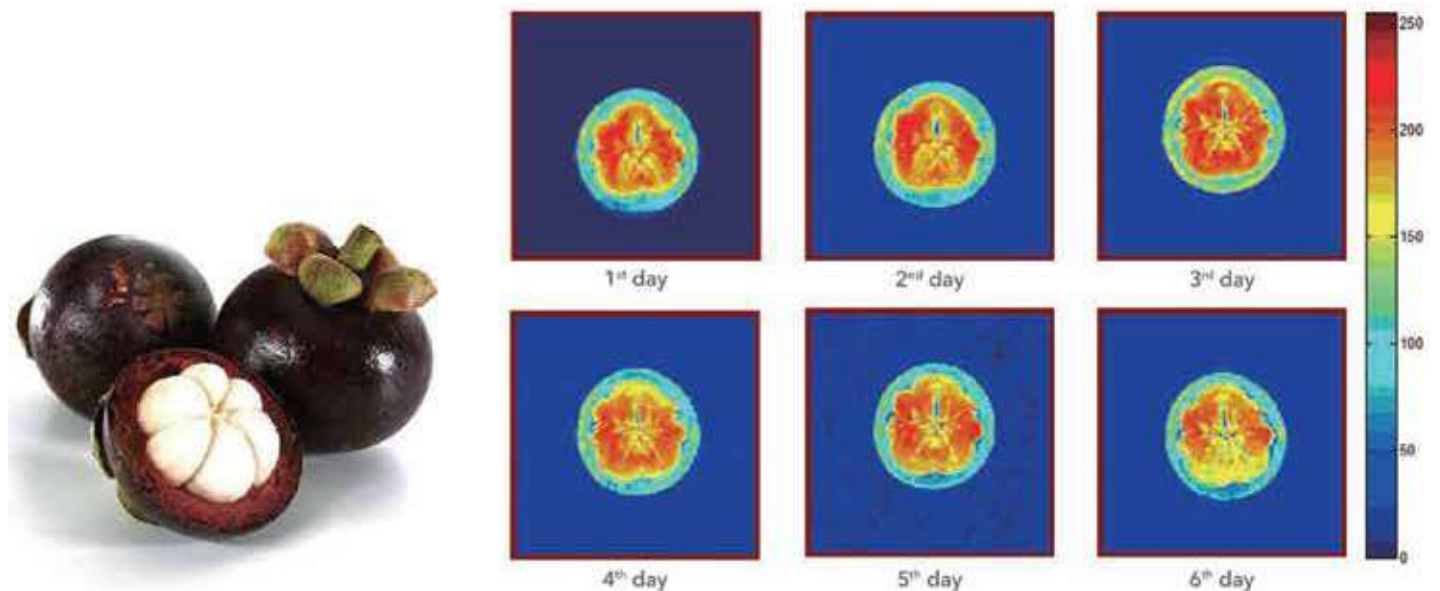


Figure 13. Changes in free/bound moisture in mangosteenfruit during storage at room temperature by MRI

The changes in the physical state of moisture in mangosteen fruit during storage at room temperature can be visualized by time-dependent MRI. Information about the decay process is available when combined with spatially selected NMR relaxation profiles.

NMR Imaging and Analyzing System:

AT-3015V/AT-3015V-I

The AT-3015 is our research grade bench top NMR/MRI for a wide range of measurements in the areas of agriculture, food and life science research. The AT-3015 is capable of T1 & T2 data acquisition, quantitative applications, and a complete suite of imaging protocols.

Application:

Food

Determination of oil/moisture content
 Quantitative analysis of water phases
 Water/oil distribution, migration and motility analysis in wateroil system
 Proton/ R_1/T_2 , weighted Imaging Analysis of water/oil spatial distribution.

Contrast Agent

T_1/T_3 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

Configuration

Magnetic field strength: 0.5±0.08T
 Available sample sizes: 15 mm/25 mm
 Effective detection area: ø15mmxH20mm(ø 15 mm in probe size)
 ø25mmxH20mm(ø 25 mm in probe size)
 Weight: 185kg
 Footprint: 560mmx650mmx1160mm



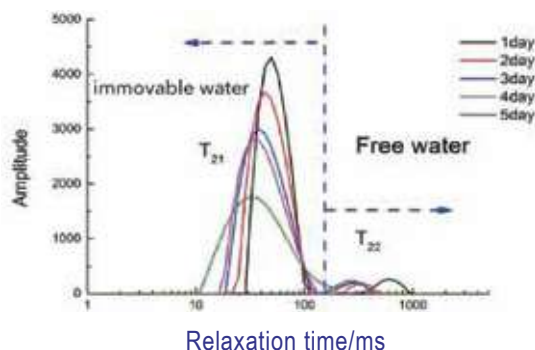
AT-3015V-I

Application Examples:

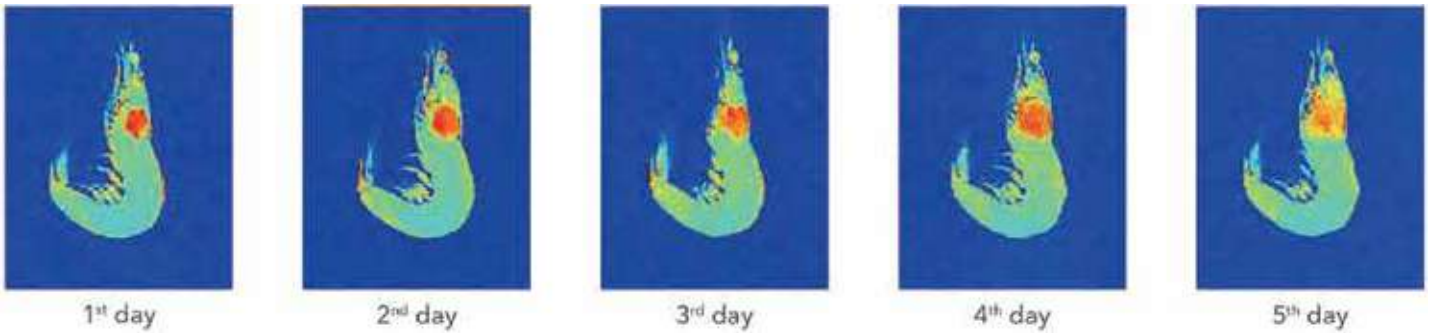
Food

Water mobility of prawns during storage at 4deg C.

The results presented in the distribution figure show an overall decrease in both bound and free water. Free water is lost by evaporation, whereas bound water is converted to free water due to breakdown of the protein structure.



Relaxation time/ms
 Figure 14. Water classification in prawns
 with relaxation spectrum



Contrast Agent:

The figure below presents two contrast agents at varying concentration but produce differences in the water T1 (brighter images show faster relaxation). Visualizing data can be utilized in vitro studies of how specific contrast agents bind to various cellular structures.

Using AT to visualize the effect of gadolinium-based contrast agents (GBCA), gadolinium Diethylene Triamine Pentaacetic Acid (DTPA) as a contrast agent for use in hepatobiliary MR imaging and gadolinium-bovine serum albumin (SSA) used in site specific binding studies.

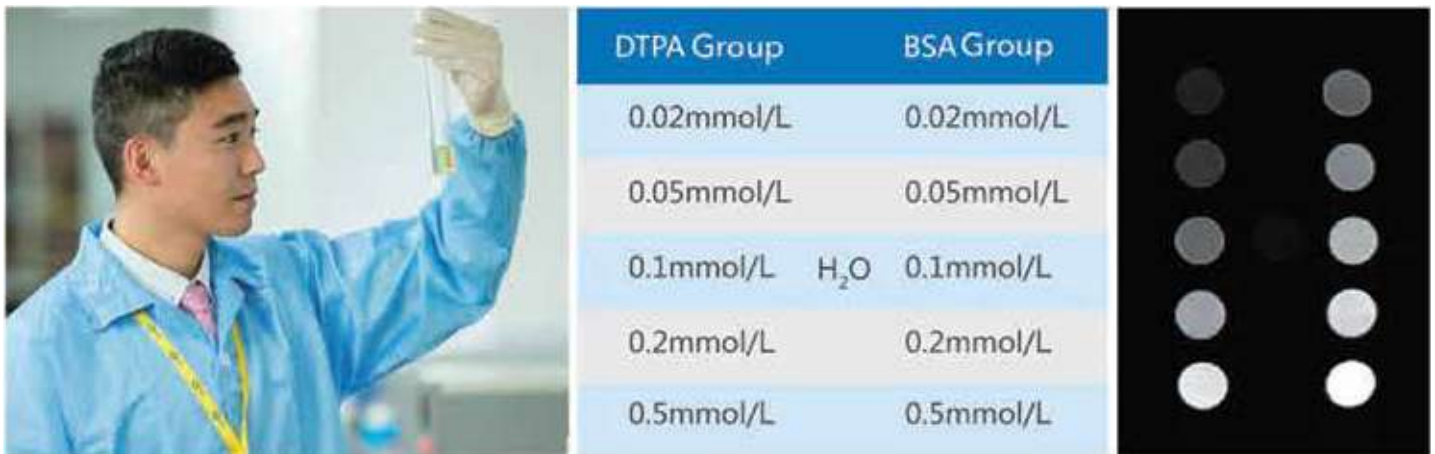


Figure 16. T₁-weighted imaging of different contrast agents at the same concentration.

The images intensity increases as the concentration of the contrast agent increases due to more efficient relaxation of water.

The AT series analyzers are available with magnetic field strengths from 0.05T to 0.3T with a range of probe sizes to optimise the sample size and sample type to the specific application. For example 2MHz is specifically designed for rock core sample measurements of porosity, permeability and pore size distribution. The low field (0.05 T) is preferable due to the need to minimize artifacts due to magnetic susceptibility effects found in porous media.

Core NMR Analyzer:

AT MICRO Series



AT-3015V-I

Configuration :

- Magnetic field strength: 0.055+0.04T
- Probe size: Ø25.4 mm
- Effective detection area : Ø25.4 mm x H35mm (standard configuration)
- Weight: 85kg(Magnet box 25 Kg, Spectrometer 25 Kg, RF unit 35 Kg)
- Footprint: 1685 mm x 520mm x386 mm(HxWxD)

Application:

Test of Conventional Core

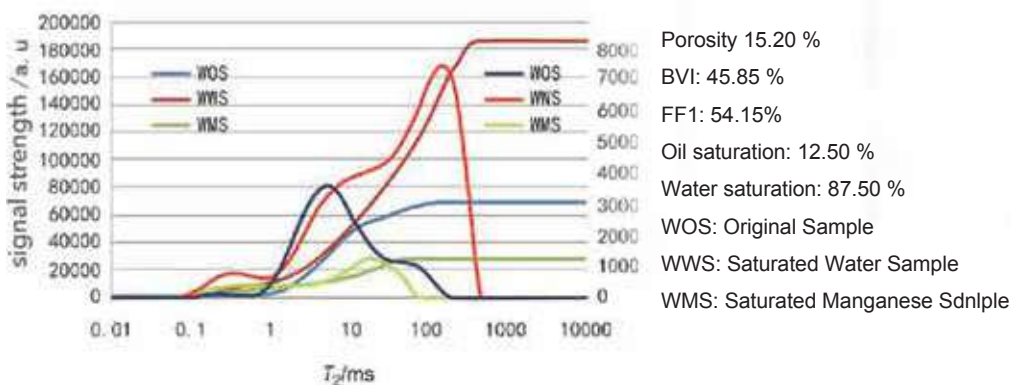


Figure 17. Calculus Spectra of Sandstone

The relaxation time of water is sharply shortened after samples were incubated in Mn²⁺ solution which caused the water signal to be restrained completely; while the oil signal can be tested.

Porosity, BVI, and FF1 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:

AT-MICROS3025V

Shale is a unique example of a low -porosity and low-permeability porous material. As such, a stronger magnetic field is required to measure these types of core sample because of the Inherent low signal resulting from a low porosity material.



AT-MICROS3025V

Configuration:

- Magnetic field strength: 0.3±0.01T
- Probe size: Ø25Amm
- Effective detection area: Ø25.4mmxH35mm
- Weight: 85 kg (Magnet box 25 kg, Spectrometer 25 kg, RF unit 35 kg)
- Footprint: 1685mm x 520mm x 386mm (H x W x D)

Functions:

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

Application Example:

Table 1. Comparison of NMR and conventional method in core porosity measurement weight(%)AD(%)

NMR method vs. Weight method				
No.	shale 1#	shale 2#	tight shale 1#	tight shale 2#
	16.83%	17.41%	1.84%	1.01%
Buoyancy porosity	17.23%	17.58%	2.55%	1.66%

NMR porosity compares well to conventional buoyancy porosity results.

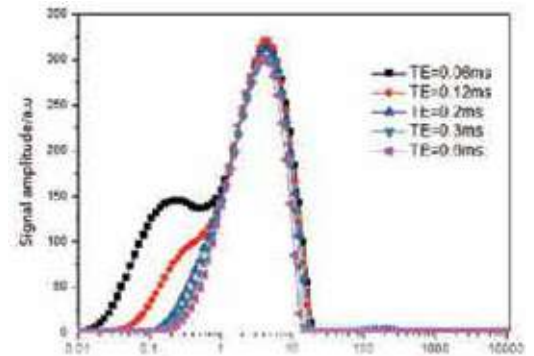


Figure 18. Comparison of shale relaxation time with different TEs
 Comparison of shale relaxation time with different echo times (TEs)

Drilling Fluid NMR Analyzer

AT-MICRODF 3025V



AT-MICRODF 3025V

The MICRODF 3025V NMR analyzer is designed especially for the analysis of drilling fluids. It can measure oil and water content of drilling fluid as well as physical properties such as the crude oil viscosity. It provides a new method for characterizing drilling muds and fluids.

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;

Application Example

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%

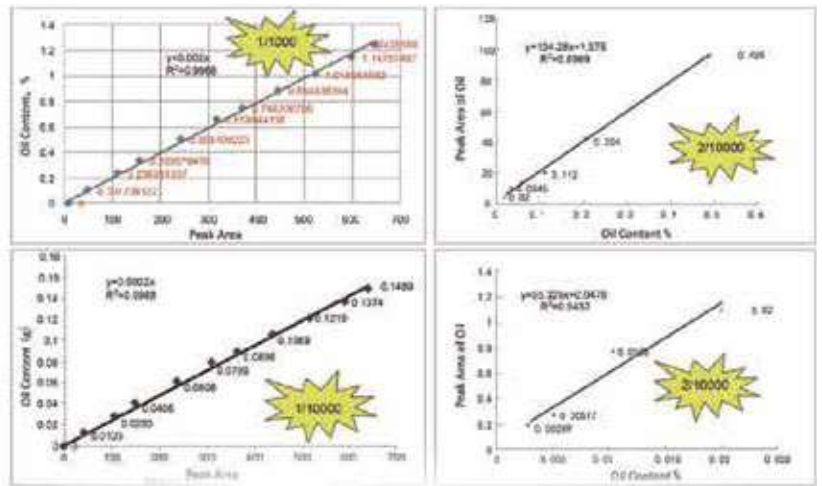


Figure 19. Result for oil content of drilling fluid
 The detection limits of oil content can down to 0.01 % with
 the accuracy of 0.002%.

NMR Solid Fat Content Analyzer

AT-PQ 2010V



AT-PQ 2010V

The determination of solid fat content (SEC) by NMR is an internationally recognized standard. Analytical has been dedicated to research and develop NMR P0001 SEC Analyzer which offers the determination of SFC values

Application Example

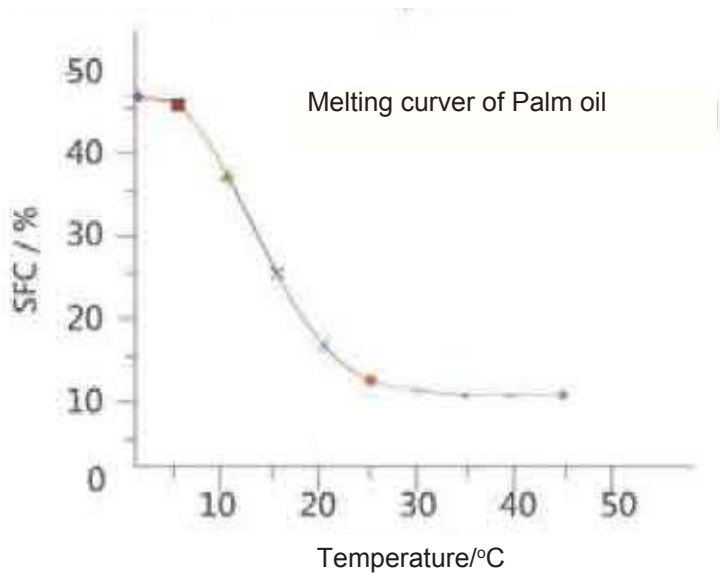


Figure 20. Solid fat content fo palm oil as a function temperature

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

MRI Contrast Agent Anlytical

AT-PQ 3015V

Features

- 1, Relaxation analysis of T2 and T1 for CAs (Fe²⁺- and Mn²⁺)
2. Rel3xation analyst5 of soated tumor ttissues
3. Relaxation analysis of cell sp

Configuration

- Magnetic field strength: 0.5+0.08T
- Probe size: ø 10mm
- Effective detection area: ø10mm xH20mm
- Weight: 134kg
- Footprint: 1685mm x 520mm x 386mm



AT-PQ 3015V

Configuration

- Magnetic field strength: 0.5+0.08T
- Probe size: ø 10mm
- Effective detection area: ø10mm xH20mm
- Weight: 134kg
- Footprint: 1685mm x 520mm x 386mm

Application Example

Table 2. Relaxivity calibration of contrast agent in different concentration

	NO	Concentration	T_1 (ms)	$1/T_1$ (m-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 ,S ⁻¹)			2.851	

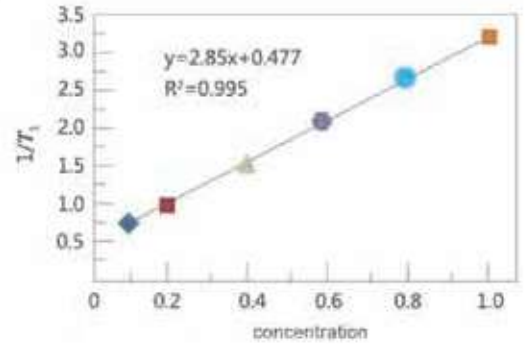


Figure 21. Relaxivity calibration curve of contrast agent in different concentration

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

Spin Finish NMR Analytical

AT-PQ 3025V

Configuration

- Magnetic field strength: 0.5±0.08T
- Probe size: 025mm
- Effective detection area: ø25mmxH25mm
- Weight: 134kg
- Footprint: 1685mmx520mmx386mm



AT-PQ 3025V

Application Example



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 analytical Technologies Limited complies with the following international standards Iso 8292 AOCs Cd 16b-93

Figure 22. Photo of sample holder in (Left); Operation interface of spin software (right)

Seed Oil Content NMR Analyzer

AT-PQ 3040V



AT-PQ 3040V

Features

Measurement of seed oil and moisture content

Configuration

- Magnetic field strength: 0.28±0.05T
- Probe size: 0 40mm
- Effective detection area: ø40mmxH30mm
- Weight: 85kg
- Footprint: 1685mm x 520mm x 386mm

Application Indexes

1. Minimum detection limit: loornq water
2. Sampl hekl <30mm
3. Test range of seeds oil content: 0.03%~100%
Accuracy: RD <2% (compared with Soxhlet extraction method)
4. Repeatability: RSD <2%, reliabiity: RSD <2% RSD: relative standard deviation RD:relative deviation

Application Example

Table 3. Comparison of NMR conventional method in oil/water content measurement of sunflower seeds

Oil contents in sunflower seeds -- NMR vs. Soxhlet extrator				
No.	Sample 1	Sample 2	Sample 3	Sample 4
NMR(%)	45.87	46.53	45.57	45.96
Soxhlet extractor(%)	46.35	46.13	46.27	46.53
Std Dev (%)	1.04	0.87	1.51	1.23
Water contents in sunflower seeds -- NMR -- NMR vs. Drying method				
No.	Sample 1	Sample 2	Sample 3	Sample 4
NMR(%)	6.41	6.37	6.6	6.42
Soxhlet extractor(%)	6.68	6.51	6.41	6.51
Std Dev (%)	4.04	2.15	2.96	1.38

Online NMR Seed Classification system

AT OMR-3015V-S

The Online MR is an automated seed handling system and analyzer designed to measure thousands of seeds per day using NMR analysis. It is the world's first commercially available NMR based sorting device and can be adapted for other near-spherical media.

Configuration

- Magnetic field strgth: 0.5±0.08T
- Probe size: ø15mm
- Effective detection area: ø12.5mmxH20mm
- Weight. 200kg approximately
- Footprint: 1110mmx940mmx1510mm

Aplication Exmple

	#479	#469	#130
mean	3.71%	3.38%	2.75%
max	3.97%	2.49%	2.84%
min	3.63%	2.20%	2.65%
max-min	0.34%	0.30%	0.19%
RSD	2.59%	2.90%	2.05%



AT OMR-3015V-I

NMR Crosslink Density Analyzer

AT CD 3010V/ AT CD 3010V+

This is a variable temperature analyzer designed to work over a large temperature range necessary for measuring the cross-link density of a variety of polymers and thermosetting resins.

Functions

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

Configuration

- Magnetic field strength: 0.5±0.08T
- Probe size: 0.10mm
- Effective detection area: 08.5mmxH25mm
- The sample temperature range:
 - +35°C to +150°C(VTMR20-010V-T)
 - +35°C to +200 °C (VTMR20-010V-T+)
- Weight: 330kg
- Footprint: 1400mmx670mmx1070mm

Application

- ☑ Determination of cross-link density of rubbers and polymers;
- ☑ Quality control and assurance in polymer production;
- ☑ Quality inspection in polymer aging;
- ☑ Rubber vulcanization process optimization;
- ☑ Molecular mobility of solids, semi-rigid polymers, gels, emulsions and liquids;
- ☑ Detection of viscosity, state and process during the epoxy resin and rubber vulcanizing;
- ☑ Adhesion properties;
- ☑ Determination of plasticizer or rubber content in blended polymers;
- ☑ Determination of relative monomer content of copolymers;



AT VT 3010V+

Application Example

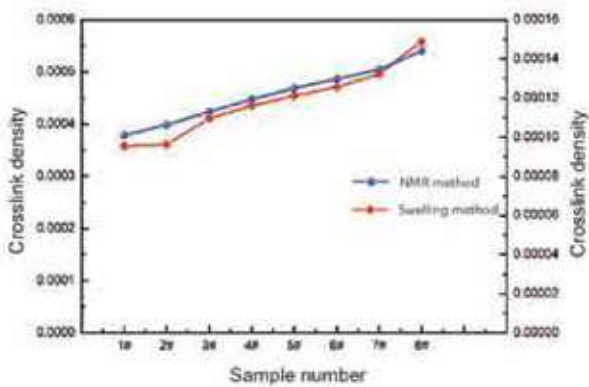


Figure 23. Comparison of NMR and conventional method in the measurement of crosslink density

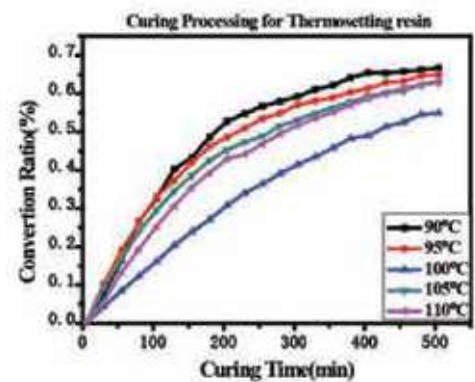


Figure 24. Characterization of curing time for Thermosetting resin 0 100 200

Cryogenic Nanopore NMR Analyzer

AT CN 3010V/ AT CN 3010V+



AT CN 3010V: air compressor; dryer; coolant trough; magnet; mainframe (left to right)

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 analytical Technologies Limited complies with the following international standards Iso 8292 AOCs Cd 16b-93

Configuration

- Magnetic field strength: 0.3±0.05T
- Probe size: ø10mm
- Effective detection area: 08.SmmxH20mm
- Weight: 330kg (Magnet 150kg, Control cabinet 180kg)
- Footprint: 560mmx660mmx1170mm

Application Indexes

Temperature range: -30°C-40°C
 (accuracy: ± 0.01°C)
 Cooling rate: 10°C/mm
 Sample volume: ~1 cm³
 Pore size: 2 nm to 500 nm

Product Advantages

- ☑ The cooling-gas supply system provides a stable and dry air flow for hours down to -60°C;
- ☑ Two-stage gas stream heating control the temperature precisely;
- ☑ Isolation of the sample temperature and magnet temperature provide a stable magnetic field.
- ☑ User friendly software automates the measurement from the initial setto results.

Application Example

1 .Porous Silica

Amorphous silica has many industrial applications such as adsorption, filtration, extraction, catalysis and so on. The NMR cryogenic method is considered to be one of the most effective way to measure the pore size distribution of this material.

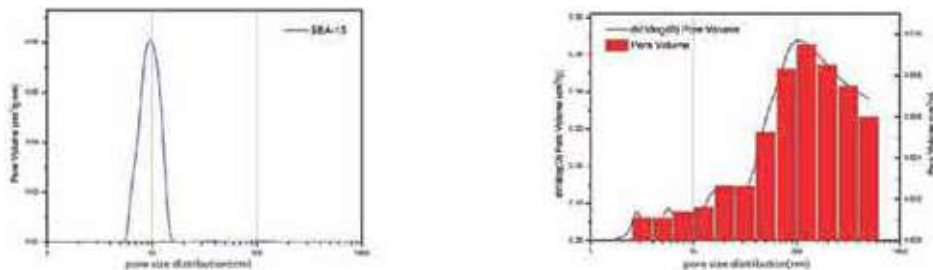


Figure 25. Pore size distribution of silica-based porous material

Education NMR & MRI Analyzer

ATEduMR 3015V/ AT MinEduMR 3001V



ATEduMR 3015V



AT MinEduMR 3001V

Configuration

- Magnetic field strength: 0.5±0.08T
- Probe size: 015mm
- Weight: 1 38kg
- Footprint: -Magnet box: 410 x 450 x 500 mm³
 -Gradient box: 450 x 133 x 410 mm³
 -Electronic box: 450 x 90 x 410 mm³

Configuration

- Magnetic field strength: 0.5±0.08T
- Probe size: 0 10mm
- Weight: 49.8kg
- Footprint: -Magnet box: 300 X 428 X 302mm³
 -Spectrometer and Gradient box: 490 x 250 X 460 mm³

The EduMR and miniEduMR are benchtop imaging instruments designed to teach students the principles of magnetic resonance imaging. These transportable instruments can be easily moved from laboratory to laboratory without the need to recalibrate so they can be used in different classrooms or laboratories.

The concepts of k-space imaging, slice selection, signal to noise, image resolution, image acquisition times, data manipulation, filtering, windowing, relaxation, image contrast, and 3D reconstruction are all demonstrable using these instruments.

Structure

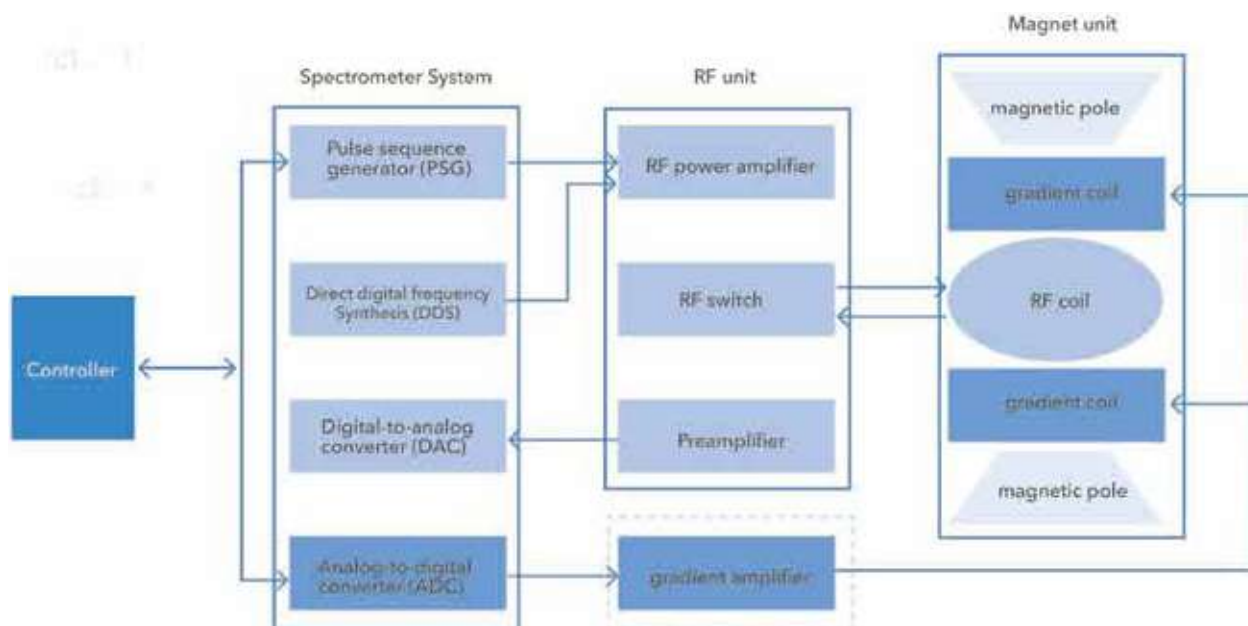


Figure 26. The whole structure of EduMR

Virtual MRI Data Acquisition and Image Reconstruction Software

ATEDUNMR

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.

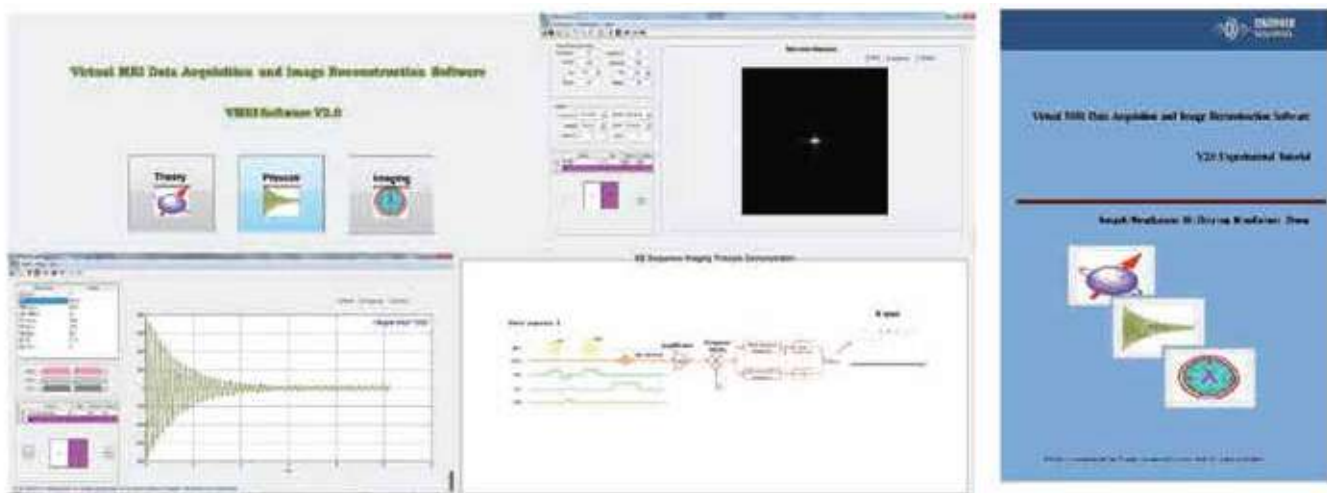
The virtual magnetic resonance imaging system can simulate the entire process. With the parameter driven interface users can select imaging sequence, the original level and imaging technology, carry out the relevant data collection. process and perform K space filling of reconstructed images. The use 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 teething 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 stimulated; Minimal investment in hardware is an advantage;
- ☑ Perform fat suppression imaging;
- ☑ Perform water suppression imaging;
- ☑ Perform Bouncepoint imaging;
- ☑ Perform half scanning imaging
- ☑ Overcomes the problem of long time of acquisition through inadequate instrumentation
- ☑ More than four pulse sequences (SE 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 fast speed.



Screenshot of ATEDUNMR

Accessories





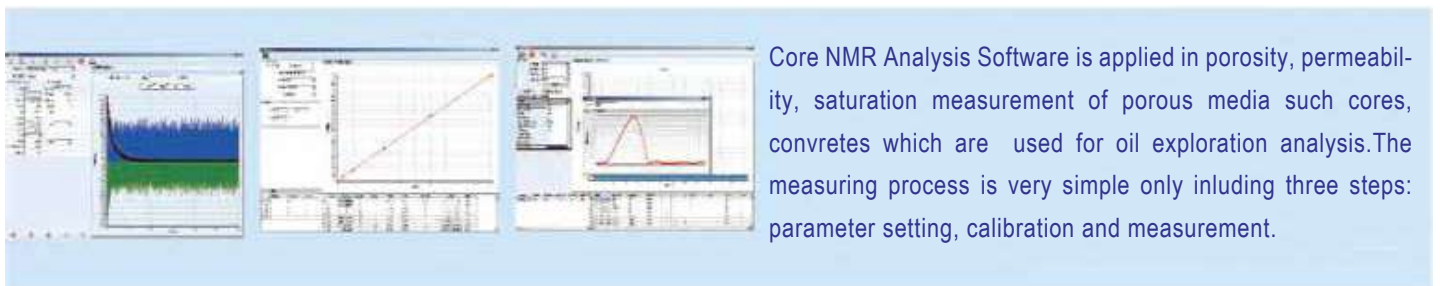
Software

General Software

NMR Analysis software (Ver3.03)

Specialized Software

Core NMR Analysis software(Ver3.0)



Fluid NMR Analysis Software (Ver3.0)



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

Contrast Agent NMR Relaxation Analysis Software

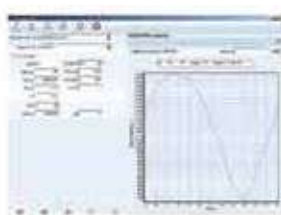
Contrast Agent Analysis Software is applied for T_1/T_2 and relaxivity test of A. The user interface is designed specially for CA research such as Gd, Fe_3O_4 and soon. very easy to use.

Solid Fat content NMR Analyzing System (Ver-2.0)



Spin Finish NMR Analysis Software (Ver-2.0)

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.



Fat & Lean & Fluid NMR Analyzing System Ver-1.0



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- HPLC Servicing** :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.
- Trainings** :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.
- AMC's/CMC** :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.
- Validations** :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.
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2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXYFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

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HPLC Solutions MultipleLabs Analytical Bio-Med Analytical Distributors Analytical Foundation (Trust)

Corporate & Regd. Office:
Analytical House, # E67 & E68,
Ravi Park, Vasna Road, Baroda,
Gujarat 390 015. INDIA

T: +91 265 2253620
+91 265 2252839
+91 265 2252370
F: +91 265 2254395

E: info@hplctechnologies.com
info@multiplelabs.com
info@analyticalgroup.net
info@analyticalbiomed.com

W. www.ais-india.com
www.analycalgroup.net
www.hplctechnologies.com
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