The Fourier 80 Benchtop

- Tackle the challenges. Add to your expertise. Bruker NMR power is now on the bench.

As easy to use and interpret as other analytical techniques

Building on decades of experience creating top-quality NMR instruments, Bruker has reimagined high-performance NMR spectroscopy in a compact, cost-efficient form: the Fourier 80 Benchtop NMR spectrometer.

With straightforward operation and software, the Fourier 80 delivers high quality data rivaling other analytical techniques. It lets scientists who are not experts in Nuclear Magnetic Resonance Spectroscopy get the definitive answers NMR provides.

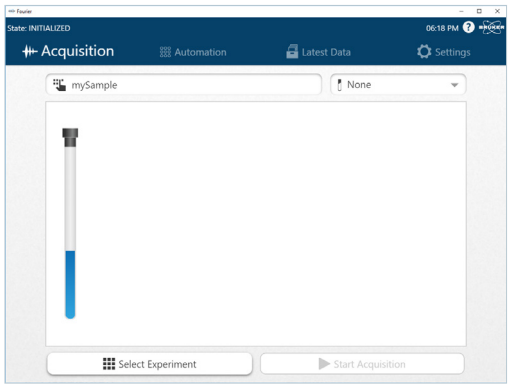
Best of all, the Fourier 80 can be installed in the fume hood or on the bench without requiring any additional infrastructure.

With the power of Bruker NMR on the bench, any scientist or technician can gain NMR expertise.

NMR's relevant chemical answers have never been so accessible

The Fourier 80's modern, intuitive GoScan software acquires high-quality sample data at the touch of a button. TopSpin™, Bruker's well-known expert software, can also be used on the Fourier.

To help scientists take advantage of NMR's unique, unambiguous answers, Bruker is continually developing workflows for specific analytical questions in a diversity of application areas.



Academic/Basic Research
Advance discovery

Education
Hands-on training

Synthesis Control
Structure verification

Forensics
Suspicious substances

Reaction Monitoring
Process control

Users can also easily create their own workflows and protocols to take advantage of NMR's power to deliver clear, high quality results in their own specialties.

Easy to own and maintain

- Cryogen-free permanent magnet
- No new infrastructure required
- Compact footprint
- Installs on bench or in fume hood
- Minimal cost of ownership

Features

High sample throughput, optimized synthesis and process control and superior data integrity

The different features of the Fourier 80 were designed to offer a compact and advanced analytical system that requires no special infrastructure, lengthy installation or complex training, bringing NMR technology to the wider laboratory market.

GxP Readiness

Bruker's GxP Readiness Kit is now available for the Fourier 80. This feature enables NMR functionality in both development and manufacturing labs to be scaled seamlessly from benchtop to enterprise operations, by using tailored software to govern data integrity and ensure compliance with 21 CFR part 11 data integrirty principles.

Pulsed Field Gradient

Bruker's benchtop NMR system includes a pulsed field gradient which has been used in high-field NMR spectroscopy for decades to quickly and conveniently obtain essentially artifact-free spectra. Gradients allow users to enhance solvent or water suppression, perform DOSY experiments, and acquire two-dimensional NMR spectra within minimal experiment time.

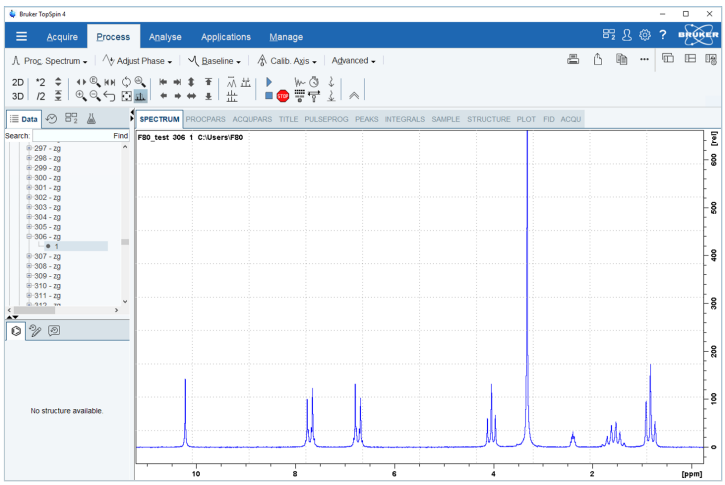
Sample Changer

A way to increase productivity is with the option of an industry-standard, robust and high-throughput PAL sample changer. Fourier 80 users with the PAL sample changer can run up to 132 samples, including 12 reference samples, thereby dramatically increasing throughput and efficiency. GoScan now also operates the sample changer to run samples overnight or over a weekend.

Academic/basic research

Tackle the challenges. Remove the barriers. Advance discovery.

Research chemists rely on NMR spectra to confirm synthesis steps, characterize molecular structures and dynamics, compile data for publication, and above all, push the boundaries of science with new techniques and discoveries. The Fourier 80 now gives them direct access to the information they need.



For basic research, the Fourier 80 offers unprecedented flexibility. It can be operated with the same TopSpin™ software that runs Bruker's high-field NMR instruments, so scientists have the freedom to adjust their workflows and techniques from the benchtop to the dedicated NMR lab, and back.

For direct access, scientists can also use the Fourier 80's streamlined GoScan software, which guides the user through pre-defined or customized data acquisition in just a few minutes.

With the hands-on Fourier 80 in university labs, researchers will no longer be frustrated by access bottlenecks and barriers and can advance their work at the touch of a button.

Academic/basic research benefits

- Work hands on with NMR in a familiar environment
- Directly obtain the exact data needed from samples
- Verify synthesized substances
- Create and modify workflows, pulse sequences, parameter sets, AU programs
- Use Bruker high-field system workflows on the benchtop

Fourier EduLab: Give students hands-on experience with the power of NMR

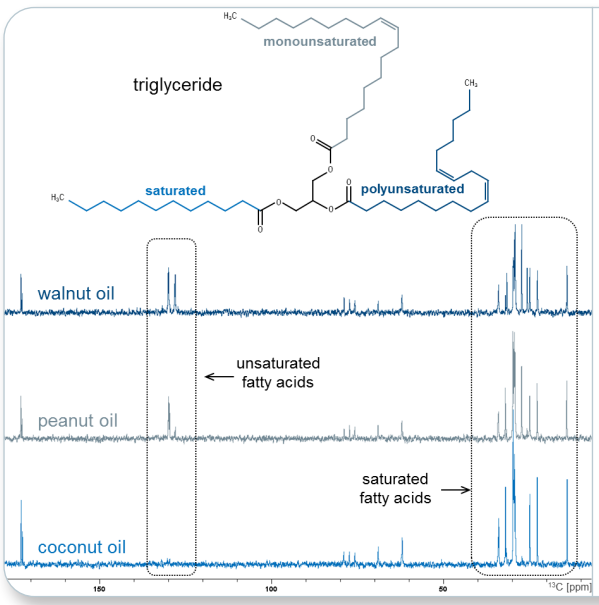
Science students should learn a wide range of analytical techniques, but the infrastructure and maintenance needs of high-field NMR can limit access. So Bruker has created a special edition of the instrument for colleges and universities called Fourier EduLab.

Students of Chemistry, Chemical Engineering, Environmental Science, Biology, and other subjects can now gain hands-on experience with NMR. The Fourier EduLab requires no new infrastructure and has low maintenance costs, which means more students can access it directly in the lab for training. And it needs no special preparation for holidays or extended breaks–simply shut it down.

Beyond the system's user-friendly GoScan software, students will gain a thorough understanding of NMR with free access to TopSpin™, the same software that operates Bruker's high-field NMR systems. Bruker supports the learning experience with a teaching package that includes suggested experiments and spectra interpretation guidance.

Fourier EduLab can easily be combined with industry-standard software for structure verification and elucidation, so students can learn how to analyze NMR spectra.

Fourier EduLab can even be offered to students alongside Bruker's microESR (electron spin resonance) Education Package, for a more comprehensive learning experience.



Education applications

Teach everyday NMR examples, such as analyzing saturated and unsaturated fatty acids in edible oils.

Other examples:

- Verify synthesized products
- Observe enzymatic reactions
- Determine pH
- Study enantiomers
- Analyze soft drinks

Fourier RxnLab: Precision and control for greater capabilities

Fourier RxnLab

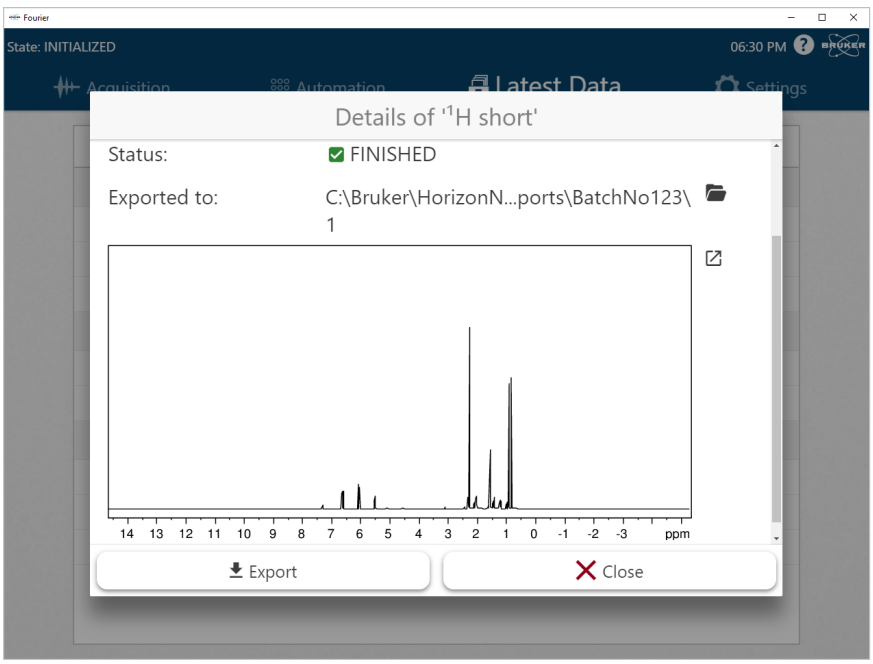
Advanced reaction monitoring capabilities are now available with the Fourier RxnLab™. Patented, temperature-controlled transfer lines, and adjustable sample temperature ensure temperature control all along the reaction mixture path to minimize temperature loss and optimize reaction outcomes precisely. Operating at a pressure of up to 10 bar and with adjustable temperature control, the RxnLab for the Fourier 80 brings NMR to the (bio)reactor with a simple push-button operation that can be used by non-NMR experts.

Adjustable Temperature

The Fourier 80 features adjustable sample temperature control (AT) with even more flexibility. The functionality is controlled by the Bruker GoScan™ and TopSpin® software programs, enabling analysis from 25°C up to 60°C and will be compatible with the automated Fourier 80 PAL sample changer.

Chemical Synthesis Control

Fourier ChemLab: Convenient, straightforward access to NMR structure verification



In academic, industrial and pharmaceutical labs, chemists need to confirm the success of synthesis steps in order to produce high-quality final products. NMR provides unsurpassed structural information about intermediate compounds and educts or side products which might influence the next synthesis step.

Using either TopSpin™ or GoScan software, chemists can get a quick structural answer with just one look at the spectrum. Dedicated software tools for automated verification are also available to provide further confidence in the synthesis process.

With the Fourier ChemLab, a compact NMR system now fits directly on the bench or under the fume hood to give immediate access to the power of NMR.

Synthesis control benefits

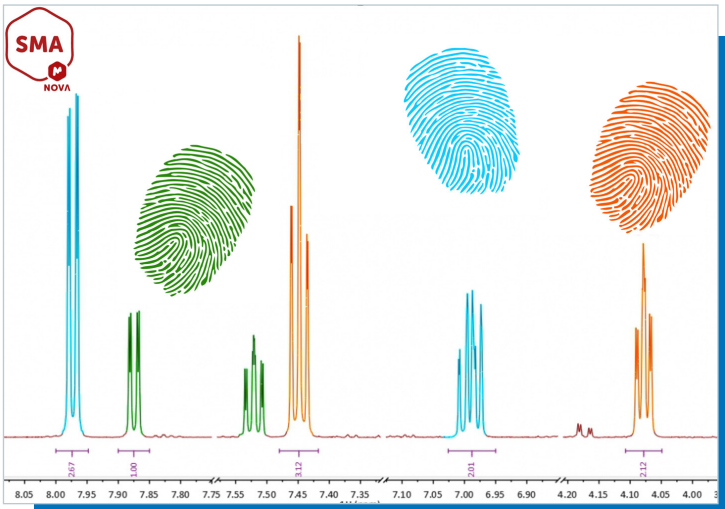
- Verify synthesized products
- Perform synthesis control directly on the bench
- Simply touch a button for software data acquisition
- Automated data interpretation
- The confidence of immediate verification

Forensics

Fourier CrimeLab: Get unequivocal forensic evidence about unknown substances

Forensic scientists need to have clear, unambiguous data about suspicious substances that is conclusive for legal proceedings. NMR provides data with a high degree of accuracy in the shortest amount of time. And now, the Fourier CrimeLab makes NMR an accessible, everyday tool for forensics.

As criminals try to disguise illegal substances to avoid standard tests (e.g. new psychoactive substances/ designer drugs), Fourier CrimeLab identifies and quantifies the structural information that determines their true nature. And the included software organizes spectra data on seized substances into a searchable database that can be shared across jurisdictions for future identification.



Forensic applications

- Analyze small organic molecules and metabolites up to mid-sized peptides and natural products
- Mixture analysis of synthetic or biological substances in solutions or composites
- Identification: signals can be easily assigned to a known structure
- Quantification: integration of all signals obtained in a dedicated spectral region
- No standard reference substance required
- Database connectivity

Fourier 80 Benchtop Technical Specifications

Operating Frequency:	80 MHz (^{1}H) (Corresponds to 1.88 Tesla)
Nuclei:	^{1}H, ^{1}H/^{13}C, ^{1}H/^{31}P or ^{1}H/^{129}Xe (contact us for more)
^{1}H Sensitivity:	Measured on 1% Ethyl Benzene: ^{1}H-only systems: ≥ 240:1 or ≥ 220:1 when pulsed field gradient incl. ^{1}H/X systems: ≥ 180:1 or ≥ 160:1 when pulsed field gradient incl.
Gradient strength:	≥ 0.25 T/m (25 G/cm)
Adjustable temperature	25°C - 60°C*
Automation:	PAL sample changer; up to 120 samples + 12 reference samples
^{1}H Resolution (@ 50/0.55/ 0.11% signal height) :	Standard: ≤ 0.4/ 15/ 30 Hz HD option: ≤ 0.3/ 10/ 15 Hz
Digital Lock:	External, no deuterated solvents needed
Sample Tubes:	Standard 5mm diameter, 7''-long NMR tubes; compatible with Young tubes
Dimensions:	~50 cm x 70 cm x 60 cm (Height x Width x Depth)
Weight:	~94 kg
Lab Temperature:	18-28°C; Measurements at sample temperature > 40°C: 18-25°C
Lab Infrastructure needed:	No liquid nitrogen or helium required no water cooling required power consumption typically <300 W power: 100 – 240 V, 50 – 60 Hz no additional venting required. AT needs compressed air or nitrogen at 5 bar.

* Incoming supply gas temperature must be min. 5°C lower than the target temperature.

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