X-Pulse with **X-Auto**

Automating broadband NMR on your benchtop

Welcome to **X-Pulse**, the only fully tuneable broadband benchtop NMR solution with a unique modular and upgradable design to future proof your analysis. Now you can achieve near instantaneous chemical analysis in your lab to address research, development, quality control and teaching needs. Using the **X-Auto** sample changer, you will save time and maximise throughput across many samples and different nuclei. With temperature control or continuous flow NMR, you can characterise reactions in more detail than ever before. Linking these with the experimental design flexibility in the **SpinFlow** software and automated spectral analyses will address your characterisation needs today, tomorrow and beyond - all within one **X-Pulse** system.

Key features:

- Fully tuneable broadband NMR
- Variable temperature measurements
- Continuous flow NMR
- High resolution
- Customisable and upgradable
- Comprehensive sample automation

Analytical solutions for:

- Batteries
- Industrial chemistry
- Pharmaceuticals
- Polymers
- Chemistry research and education
- Reaction monitoring

X-Pulse

Modular benchtop NMR to match your analytical challenges

Choose the probe for your application

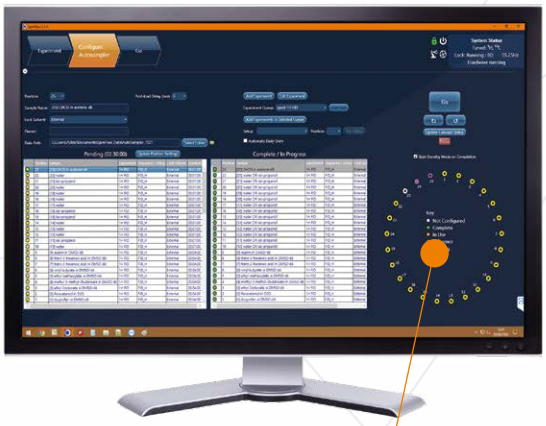
X-Pulse is the only benchtop NMR spectrometer with a user removable probe allowing you to choose high SNR, X-channel and external/internal lock to address your application and ensure easy maintenance.

Automation or manual loading?

Use standard 5mm NMR tubes with manual loading or the **X-Auto** sample changer to pre-load 25 samples.

Static or flow?

Use a wide variety of standard NMR tubes or use our specially designed flow cell to monitor your reaction in real time.



Unique software solutions

Build your own spectral databases. Fast track your data analysis with automated pattern matching and outlier detection tools. Use industry standard processing software to ensure consistent processing across all your NMR data.

Variable temperature

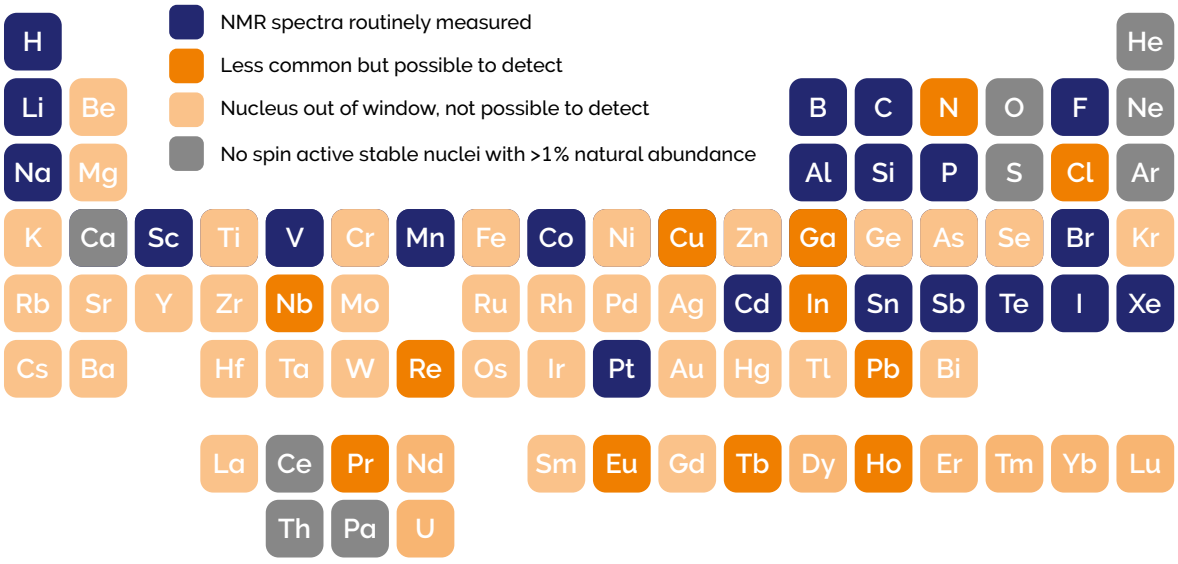
Heat or cool your sample to temperatures between 0˚C and 65˚C with true gas variable temperature system.

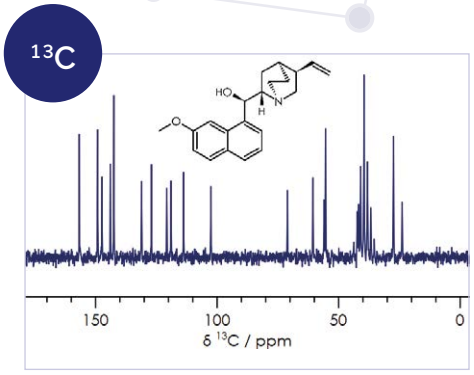
Choose your nuclei

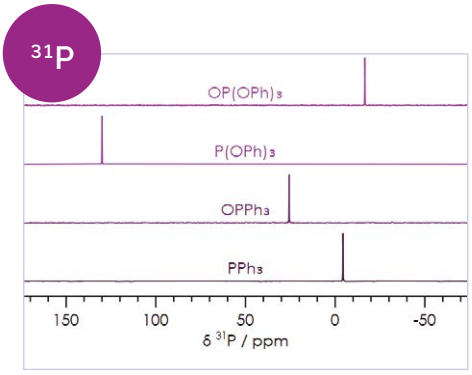
Configure your **X-Pulse** as broadband, dual-X or HF to suit your chemistry needs today and seamlessly upgrade whenever they change.

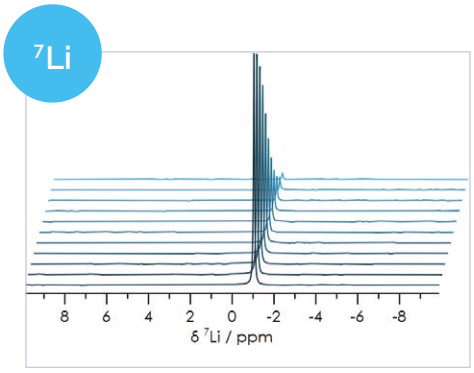
Choose your nuclei

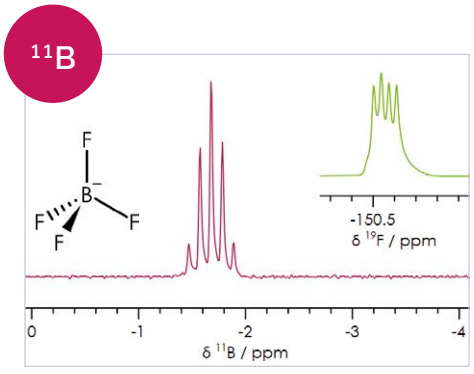
Address a wider range of analytical challenges in research, development, QC and teaching with the only fully tuneable broadband benchtop NMR system. **X-Pulse** can be configured as **Broadband**, giving you the option to tune to any NMR active nucleus with a frequency between ^{29}Si and ^{31}P. The **Dual–X** configuration allows you to choose two nuclei from the broadband frequency or select the **HF** configuration to maximise your sensitivity for ^{1}H and ^{19}F. **X-Pulse** maximises your efficiency by enabling the collection of spectra from multiple nuclei without hands-on interaction with the instrument.

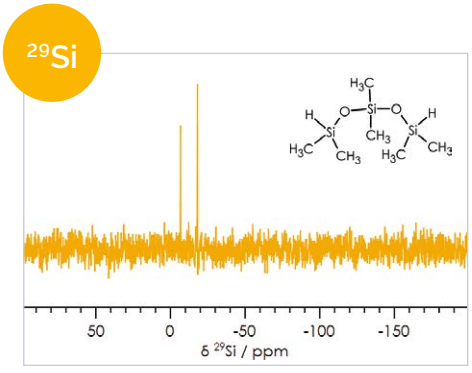


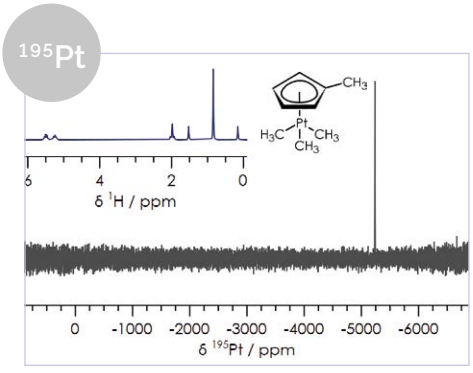








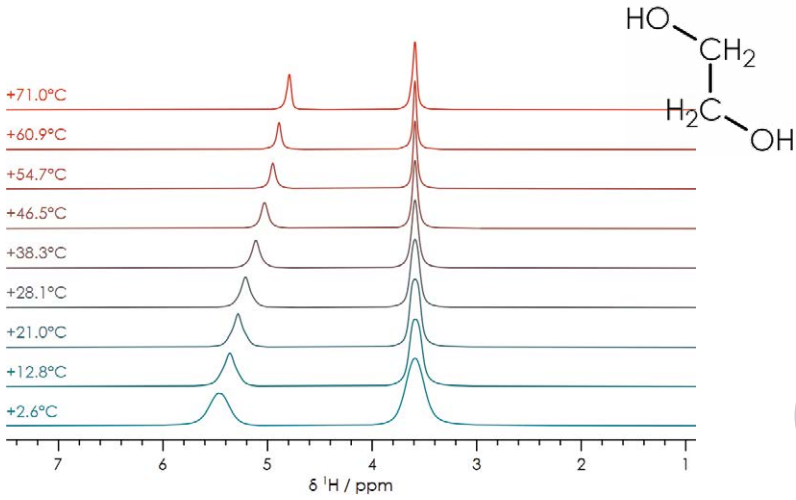


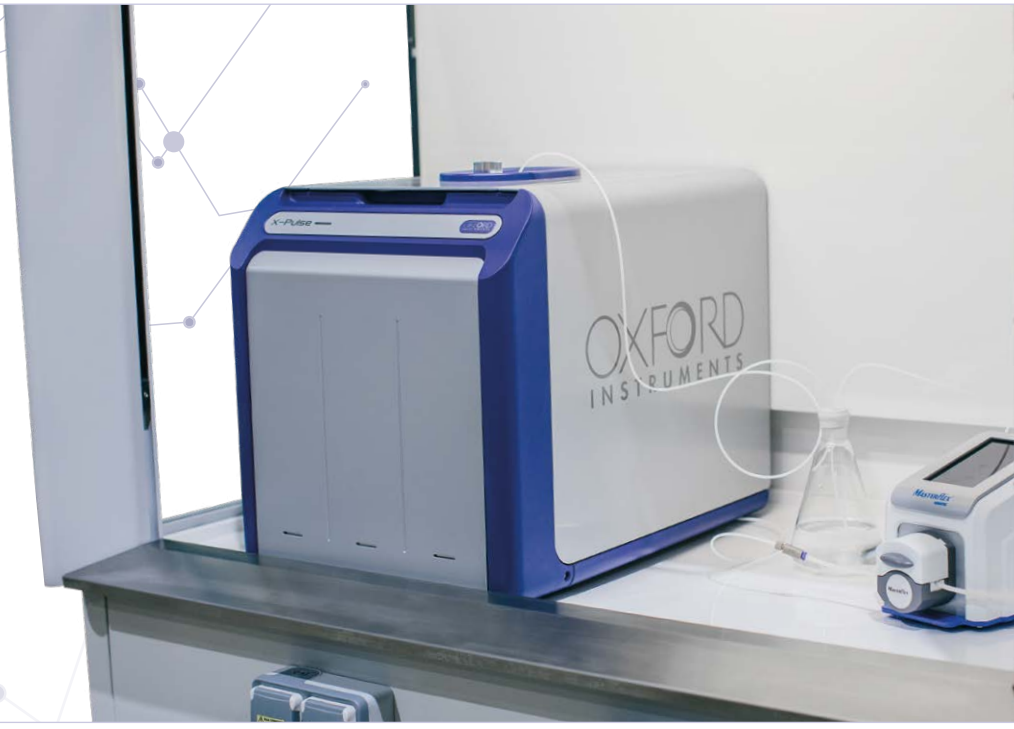


Understand your chemistry as it happens

Variable temperature NMR on your benchtop

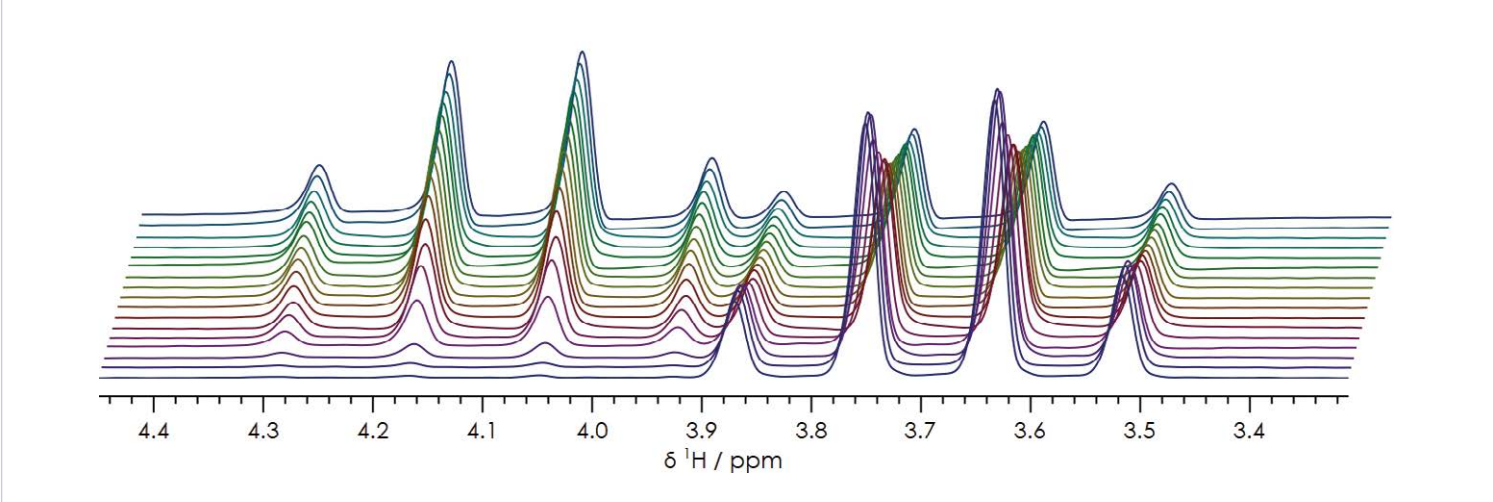
Expand your analysis possibilities and understand the temperature dependence of your chemistry. Heat or cool your sample between 0°C – 65°C with true gas variable temperature for benchtop NMR.



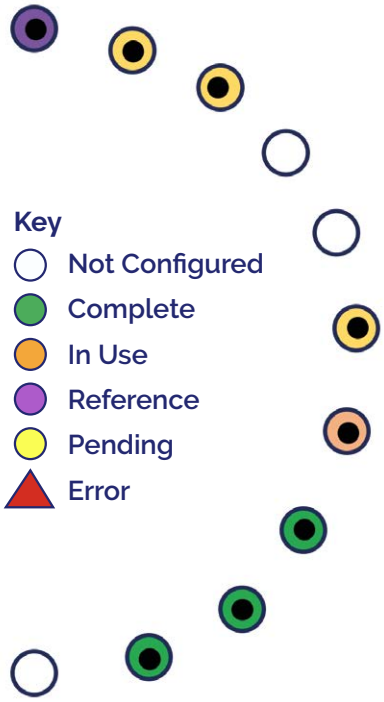


Reaction monitoring

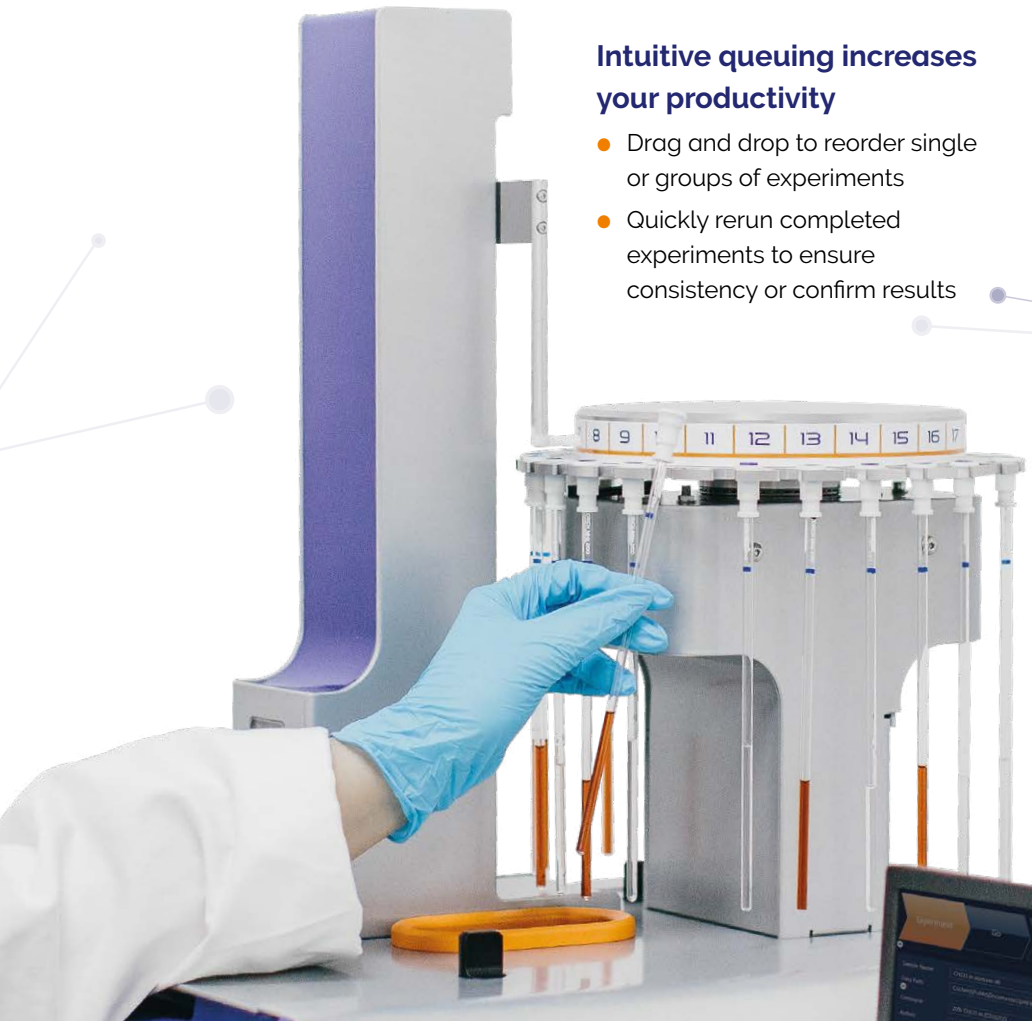
From determination of reaction end points to understanding kinetics, see the changes in your chemistry as they happen either statically in the NMR tube or using continuous flow from the reactor with the bespoke **X-Pulse** flow cell.



X-Auto



Fully automate data acquisition across 25 samples, all controlled from within the **SpinFlow** acquisition software. No need to stop to add new samples, just drop the sample in and set up your experiments. **X-Auto** provides you with the flexibility you need for your experiments - use different NMR tubes with lengths ≥20 cm, diameters ≤5 mm, and a range of specialist fittings.



Intuitive queuing increases your productivity

- Drag and drop to reorder single or groups of experiments
- Quickly rerun completed experiments to ensure consistency or confirm results

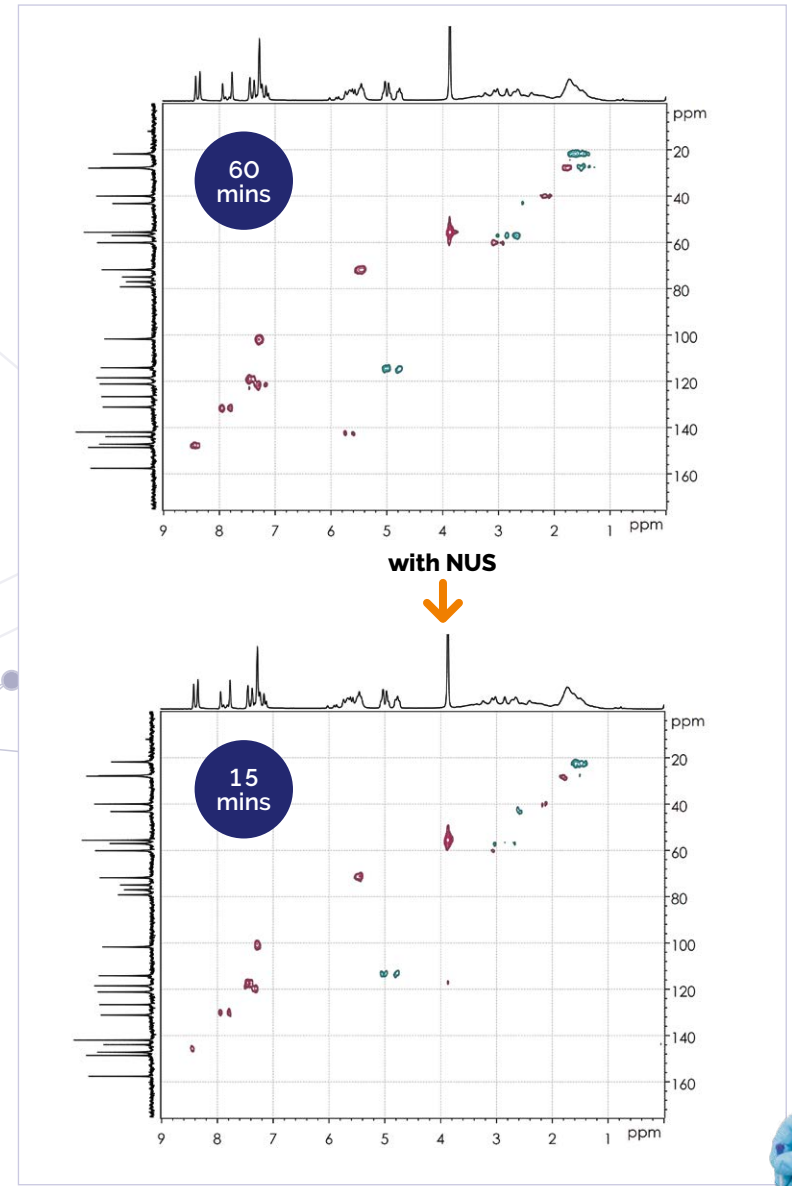
Add new experiments with a single click

- Single acquisitions
- Predefined experiment queues
- Automated optimisation sequences

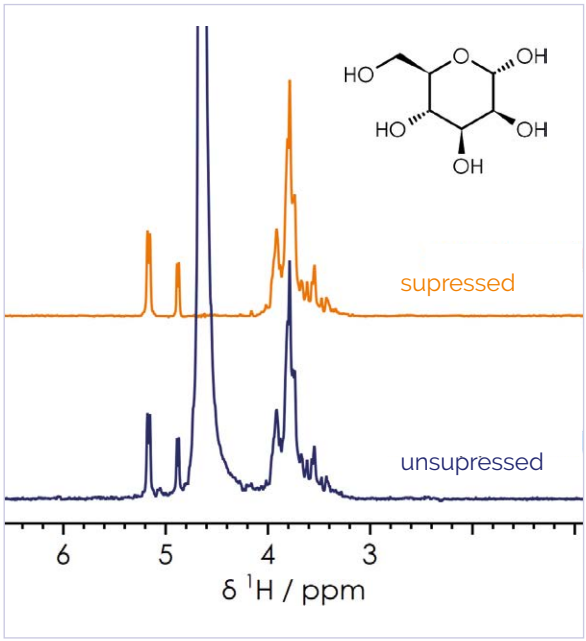
From spectra to structures

X-Pulse has all the tools you need to understand your molecules and determine their structure.

- Simple 1D spectra
- 2D experiments
- Inverse experiments
- Shaped RF pulses
- 3-axis pulsed field gradients



Advanced techniques such as non-uniform sampling (NUS) enable you to get your answers faster.

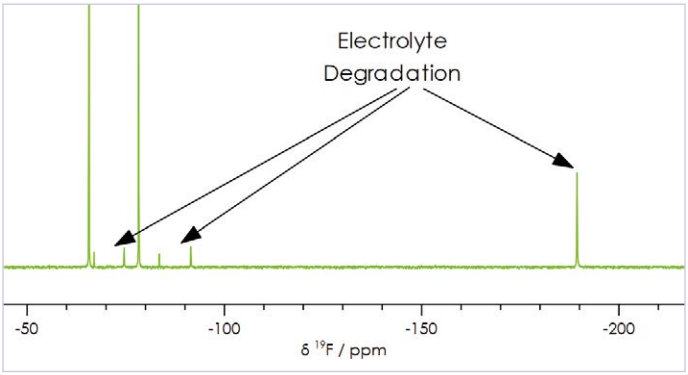


Shaped pulses and pulsed field gradients improve solvent suppression. Pulsed field gradients additionally measure self diffusion.

Applications of **X-Pulse**

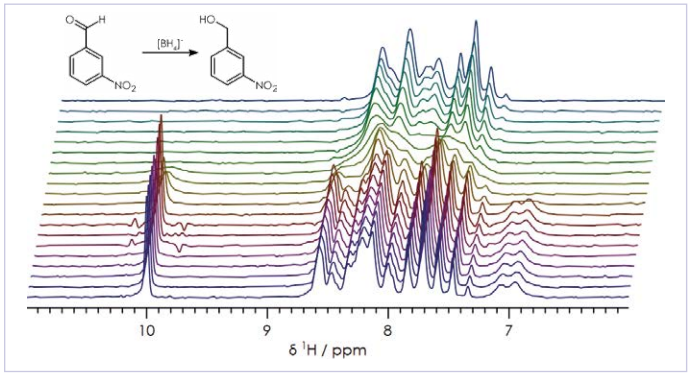
Energy Storage

A broadband **X-Pulse** with pulsed field gradients and sample temperature control provides comprehensive characterisation of battery electrolyte structure, dynamics and ion transport properties. This increases materials quality control efficiency, accelerates electrolyte development, and enables cell failure analysis.



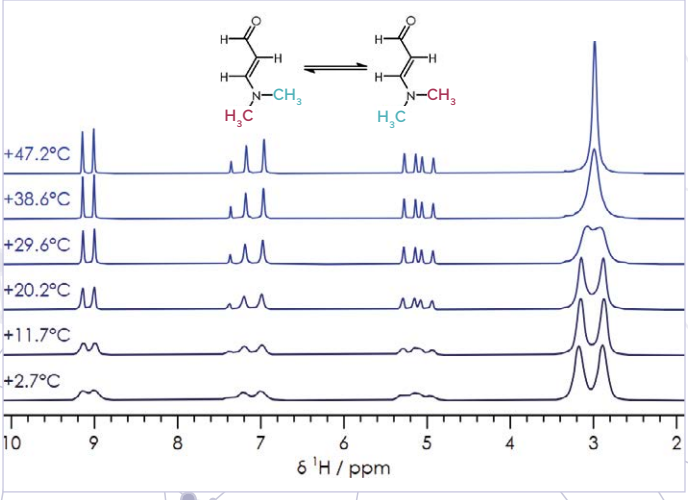
Pharmaceuticals

X-Pulse equipped with sample automation or flow NMR is the perfect tool to assess dosage form potency and quality over a large number of samples or to optimise synthethesis methods that accelerate scale up and improve yield during lead development.



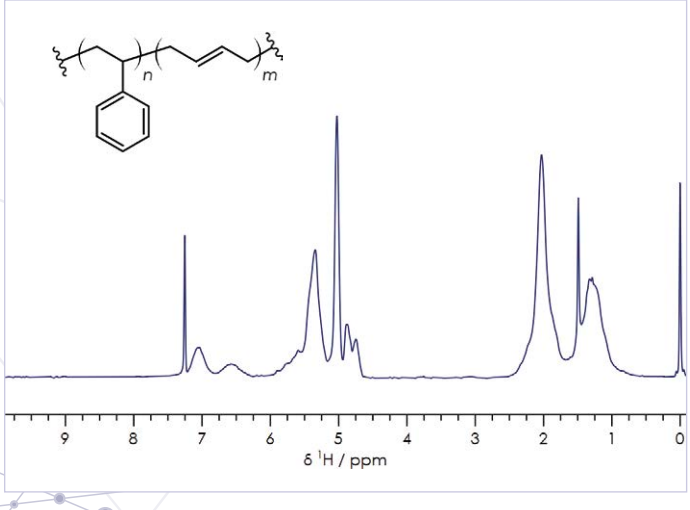
Chemistry Research

Whether developing new materials, understanding reaction dynamics or discovering new synthetic paths, the modular, fully upgradable **X-Pulse** is future-proofed to provide all the analysis you will need in your lab. Powerful **SpinFlow** software maximises instrument functionality from easy experiment optimisation through to implementing new NMR sequences.



Polymers

Analysing polymeric materials using broadband NMR with variable temperature control accelerates the development of more sustainable alternatives. This ranges from structural characterisation of new materials, including silicone or bio-polymers through to identification of contaminants, additives, and impurities in quality control.



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