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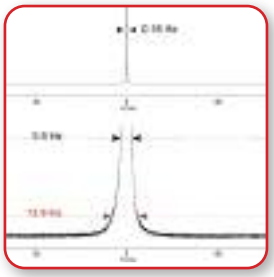
Spinsolve 80

Unparalleled performance with unique flexibility

The benchtop NMR spectrometer with the most powerful features

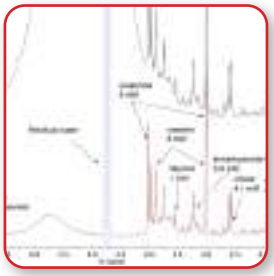


Unique resolution

The resolution of the Spinsolve magnets is about two times better than any other commercial solution. Moreover, it is the only spectrometer specified at 0.11% of the peak height.

On-line monitoring

The flow kit developed for the Spinsolve can be easily mounted to pump chemicals through the Spinsolve for real time monitoring of reactions.



Solvent suppression

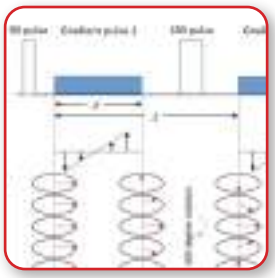
The ULTRA narrow lines of this model make it possible to strongly attenuate the solvent peaks to confine them to a region narrower than 0.2 ppm.

Autosampler

The compact sample changer designed for the Spinsolve is controlled by the Spinsolve Software to offer full automation.

Multinuclear probes

The new Multi-X family of probes can measure multiple nuclei with a single instrument in a fully automatic way.



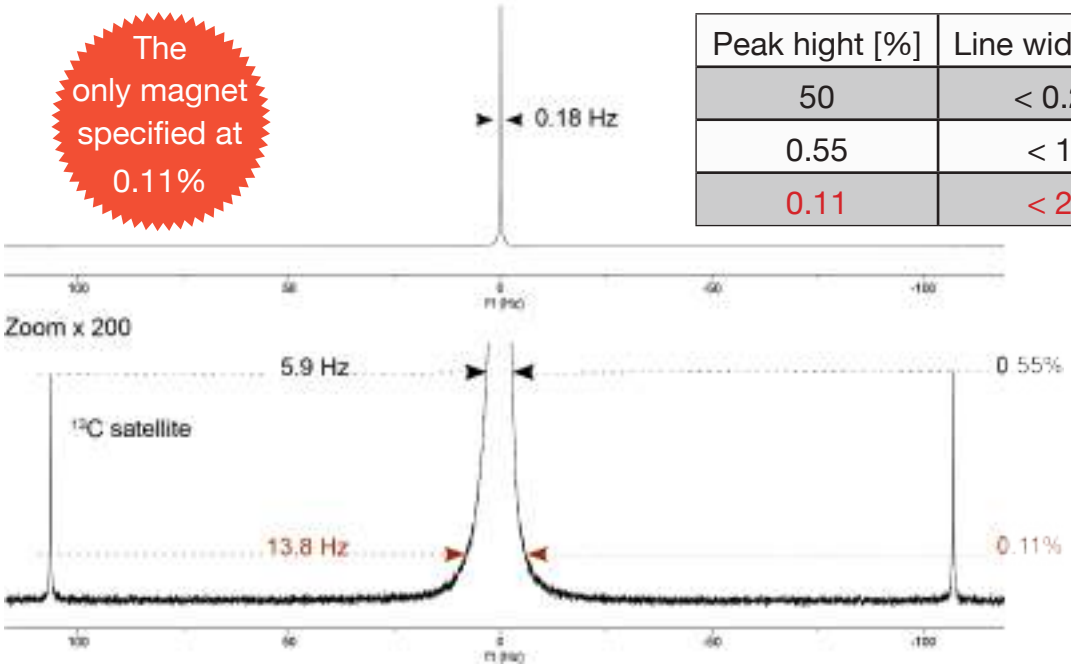
DOSY Gradient

The Spinsolve 80 can be equipped with the strongest pulsed field gradients (**0.5 T/m**) for diffusion or DOSY experiments.

Spinsolve 80 ULTRA

The ULTRA high magnetic field homogeneity of the Spinsolve magnets provides- the highest spectral resolution

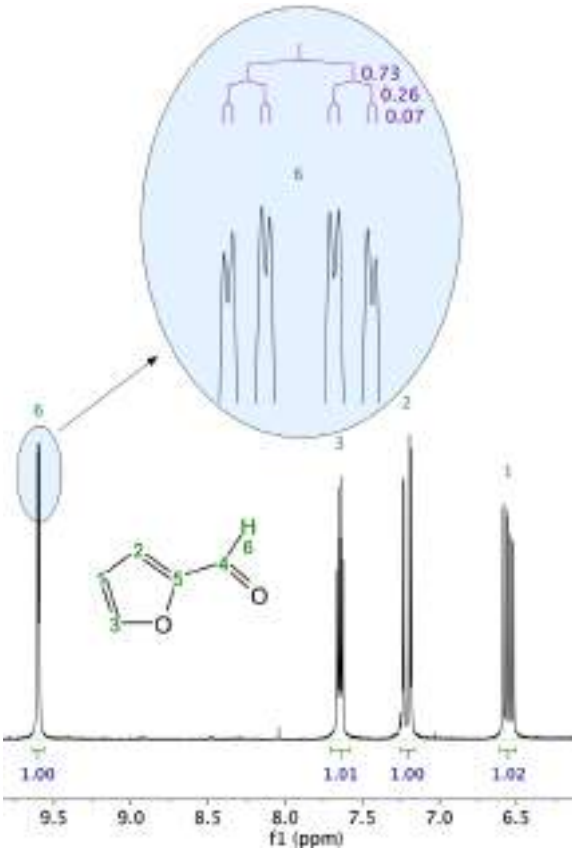
The only magnet specified at 0.11%



Peak hight [%]	Line width [Hz]
50	< 0.25
0.55	< 10
0.11	< 20

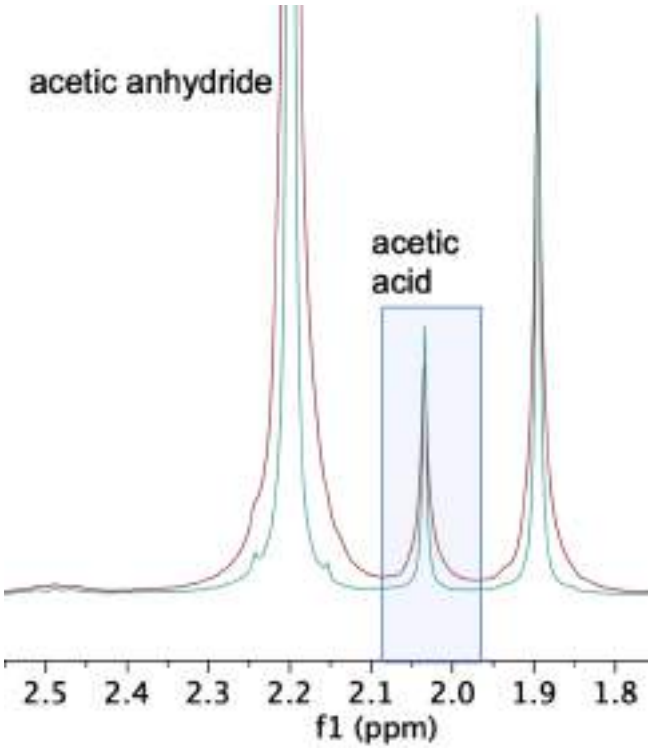
Resolve the finest structures

Resolve up to ^{5}J couplings as small as 0.07 Hz like in no other benchtop NMR spectrometer.



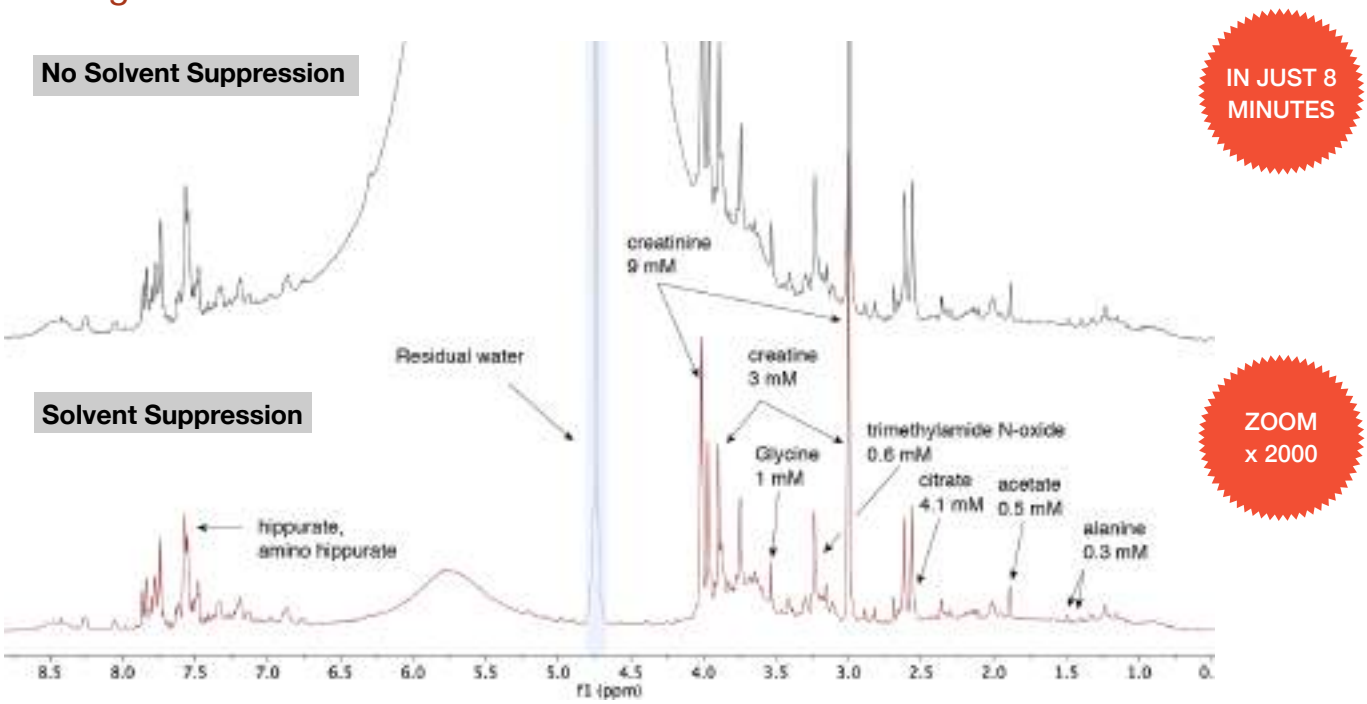
Improve quantification accuracy

In this example, the ULTRA resolution makes it possible to integrate the acetic acid peak without suffering from any overlapping with larger adjacent signals. With a lower resolution of 0.4 Hz, the overlapping is more pronounced and the integrals are affected.



Superior solvent suppression performance

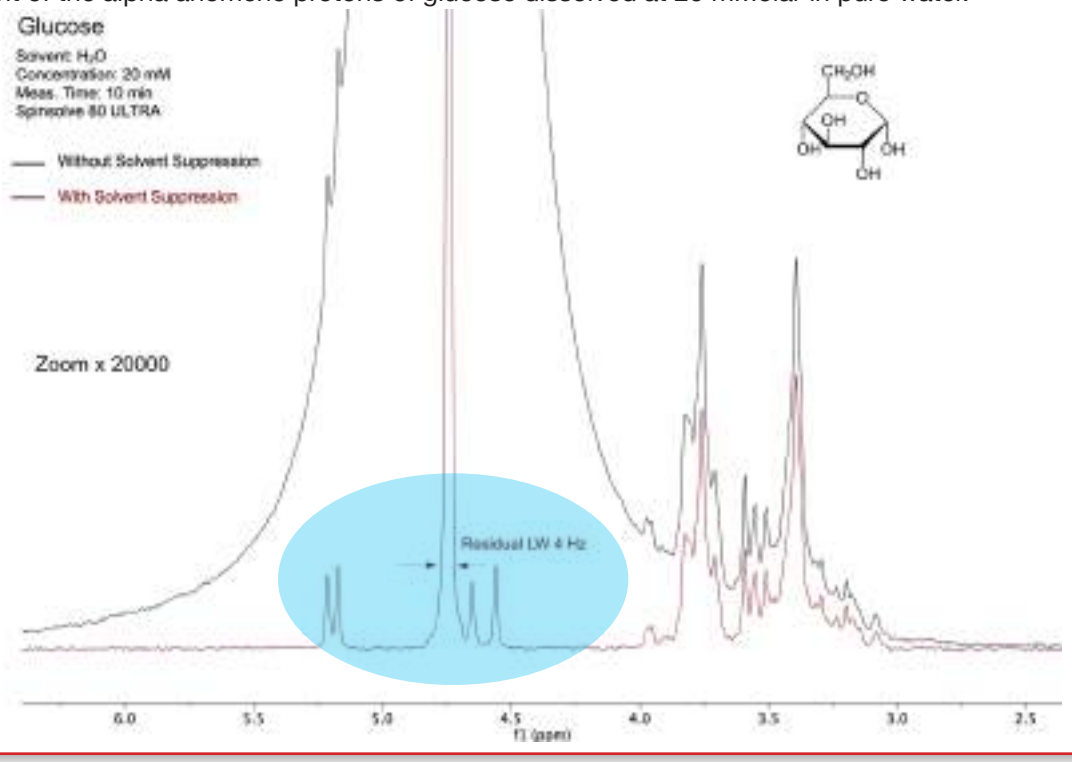
Resolving metabolites in urine at milli-molar concentrations in a few minutes



Urine contains a large number of metabolites dissolved in pure water at very low concentrations. The figure above shows the comparison of the spectra acquired with (red) and without (black) solvent suppression. The suppression sequence strongly attenuates the water signal (marked in blue) with impressive efficiency.

Reference for evaluating the performance of the solvent suppression method

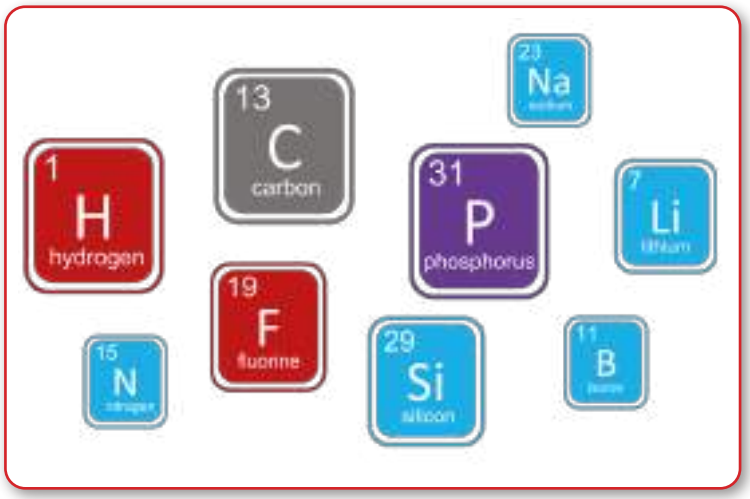
To quantify the efficiency of the solvent suppression method, the attenuation and the linewidth of the residual solvent peak need to be measured. While the attenuation factor can be easily determined by comparing the residual peak with the amplitude of the full solvent peak, the linewidth of the residual signal needs to be measured at an absolute height in the spectrum. This absolute height is typically defined by a reference compound added to the sample at a given concentration. In the figure below we measured the residual width at the height of the alpha anomeric protons of glucose dissolved at 20 mMolar in pure water.



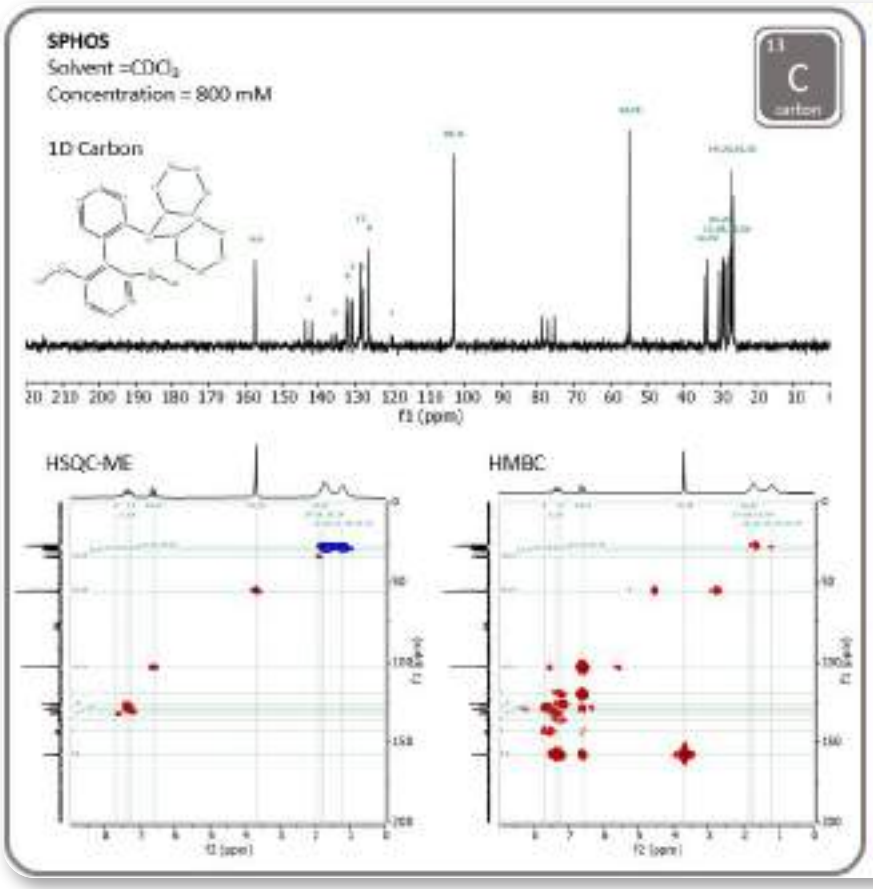
Spinsolve™ Multi X

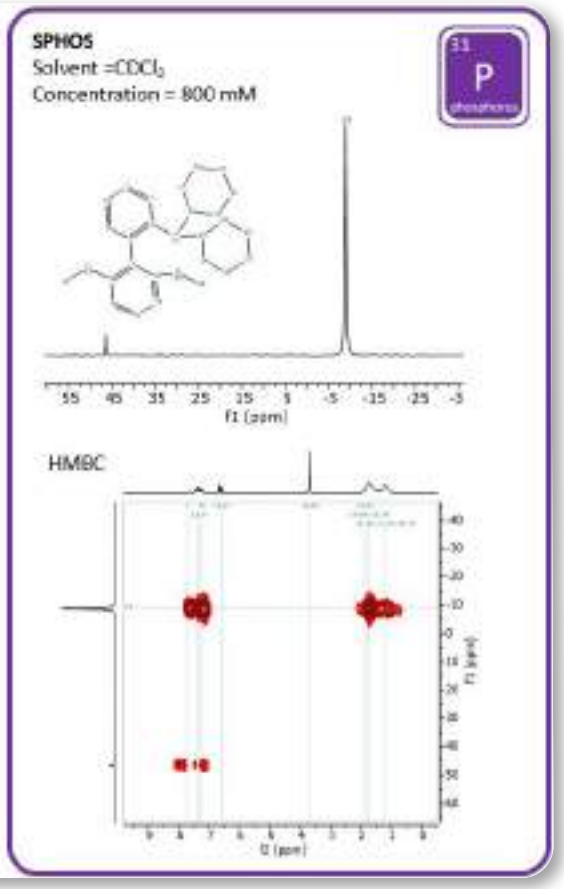
The new generation of fully automatic multinuclear probes

The Spinsolve spectrometers can be equipped with the new Multi-X probes to automatically measure multiple nuclei with the one instrument. These probes are equipped with a set of electronic switches that eliminate the need for any user intervention to switch from nucleus to nucleus. Electronic re-tuning ensures that calibrations of the system for the different nuclei remain unaffected when nuclei are switched back and forth. This feature works perfectly with the autosampler to measure a set of samples where multinuclear experiments need to be individually pre-defined.



Advanced multinuclear experiments automatically acquired for a SPHOS sample





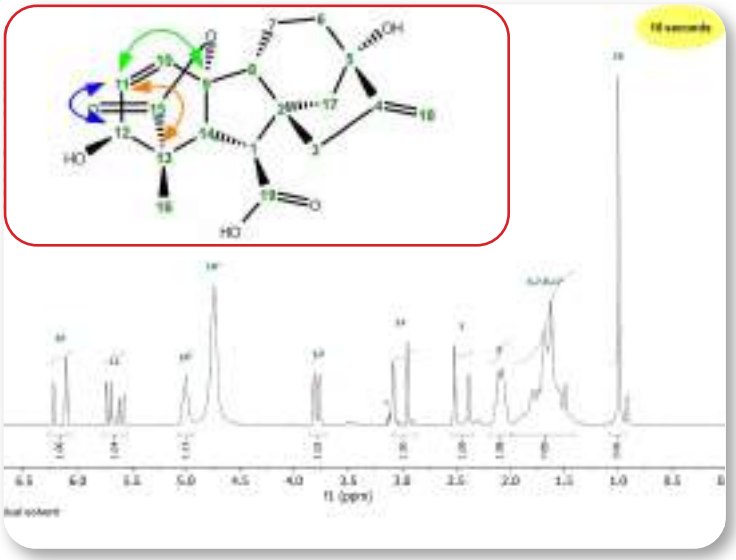
The most advanced multi-nuclear methods... in one click!

Collect the full set of homo- and hetero-nuclear multidimensional experiments providing decisive information for structure confirmation **in less than one hour**.

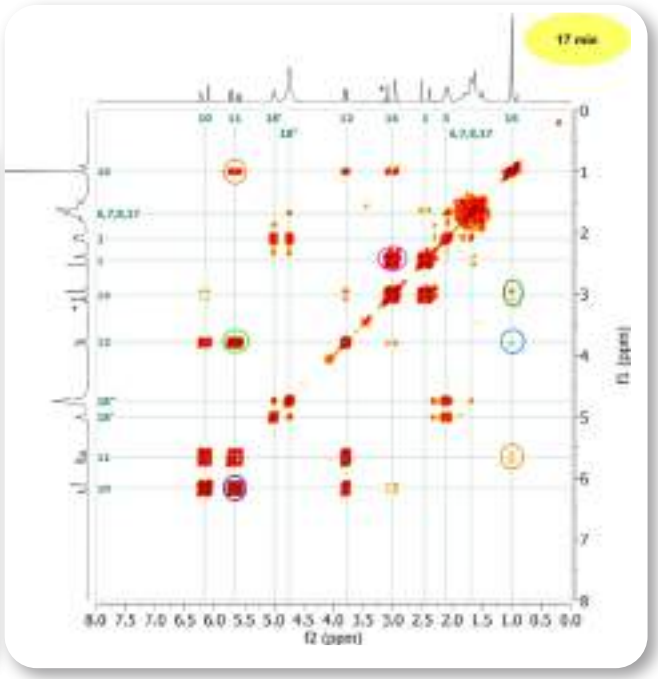
80 MHz NMR spectra of Gibberelic Acid

Solvent: MeOH-d6

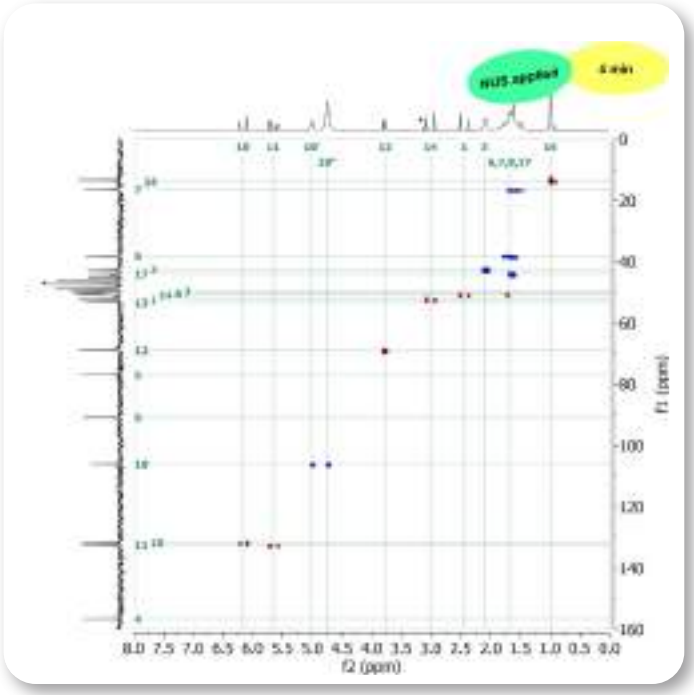
Concentration: 250 mM



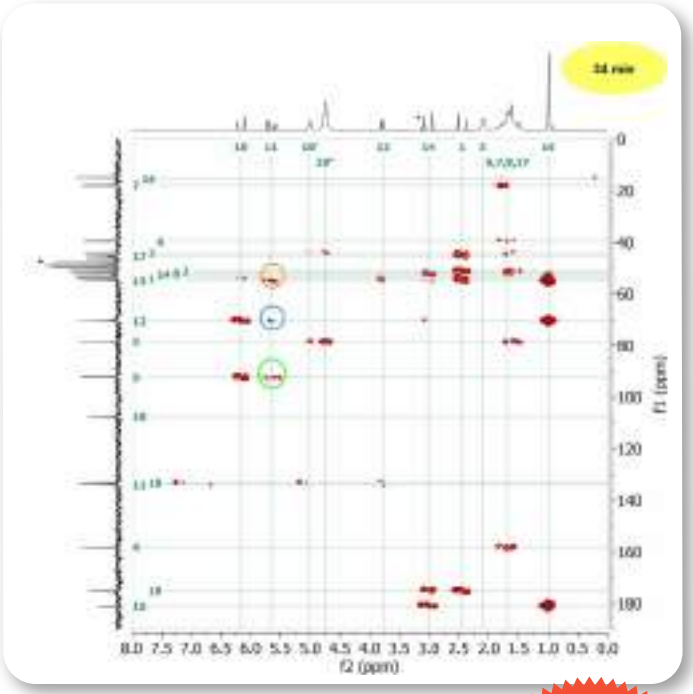
1D Proton



gs-COSY



gs-HSQC-ME: acquired in just 4 minutes with Non-uniform sampling (NUS)



gs-HMBC

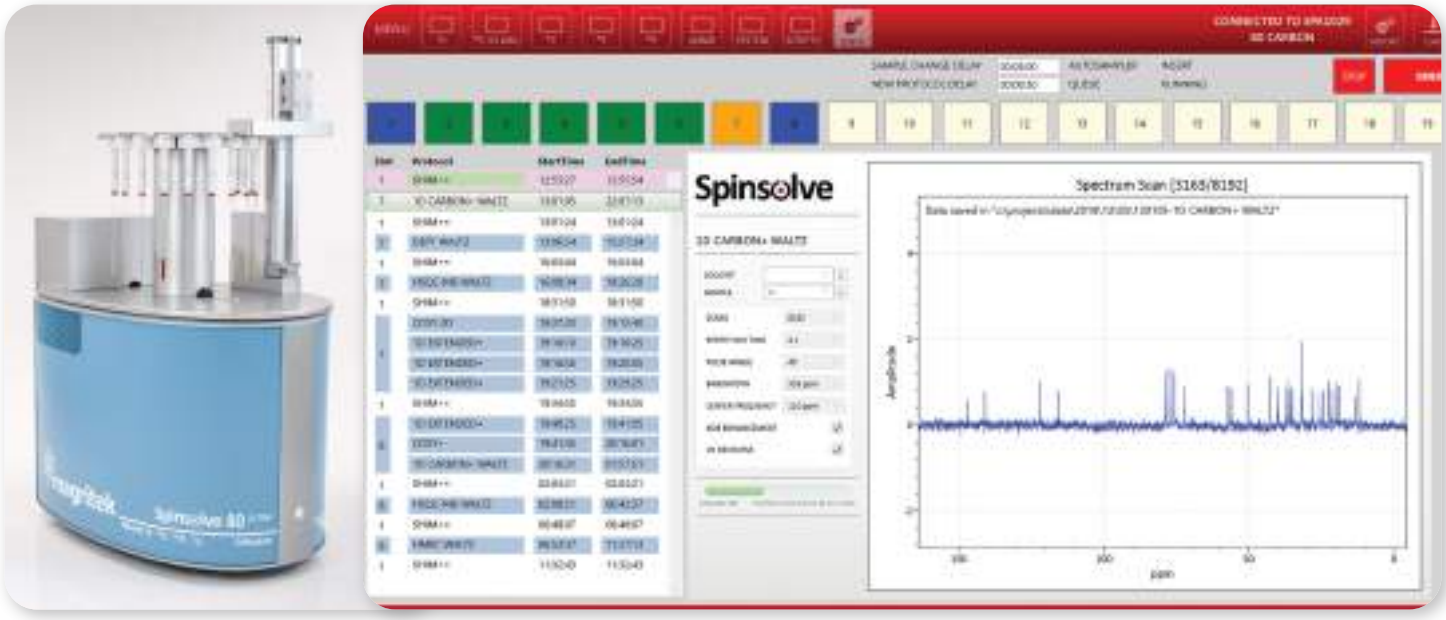
Gradient assisted methods

On-line Reaction Monitoring kit

All Spinsolve models can be equipped with the RM flow kit developed to pump samples through the system for on-line analysis directly inside the fume hood. This kit includes a glass flow cell that minimizes the dead volume of the flow setup by using thin capillary tubes that go from the inlets to the center of the cell and maximizes the NMR sensitivity by expanding the tubing in the center, where the NMR coil is positioned. Thanks to the optimized design of the flow cell, the SNR in flow mode is identical to using standard 5 mm tubes. The kit includes also a peristaltic pump that is controlled by the Spinsolve software to run in continuous or stop flow mode. The flow cell can be easily inserted in the Spinsolve and can be connected to the pump by means of thin PTFE or peek tubing. The Spinsolve software includes a powerful monitoring module that has been developed to follow reactions in real time. It synchronizes the pump with the measurements of the different protocols that are included in the loop and offers advanced data processing tools to display the conversion curves.

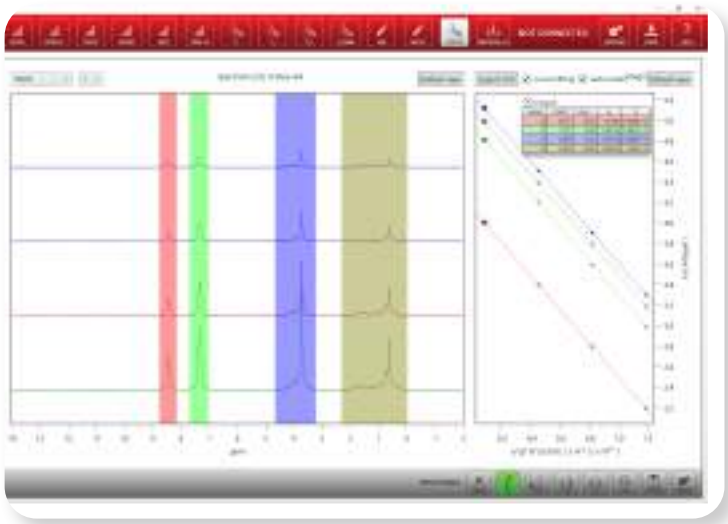
Full Automation

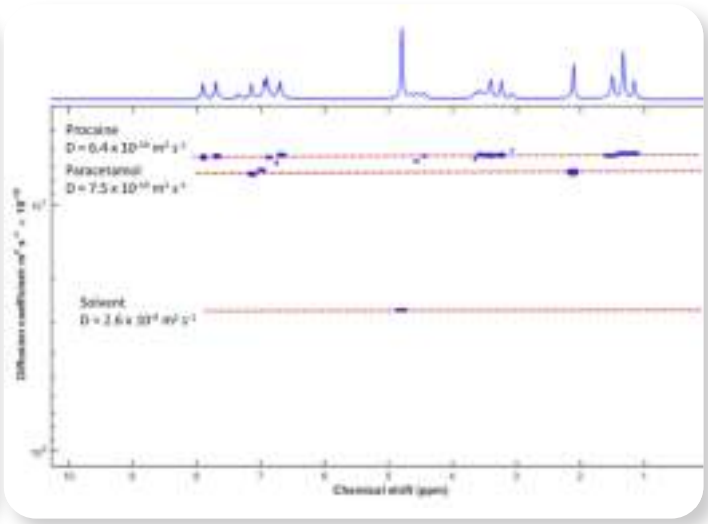
Increase your sample measurement throughput by integrating the new fully automated autosampler carousel with your Spinsolve. The autosampler fits on the top of the Spinsolve and is easily added or removed for transportation. The queue of protocols to be run for each sample can be built in just a few seconds and can be edited at any time, even while data is being collected.



The strongest diffusion gradients for DOSY experiments

- Separate the spectra of different components in a mixture by molecular size (DOSY-type experiments)
- Measure self-diffusion coefficients to understand molecular mobility (PFG diffusion measurements)

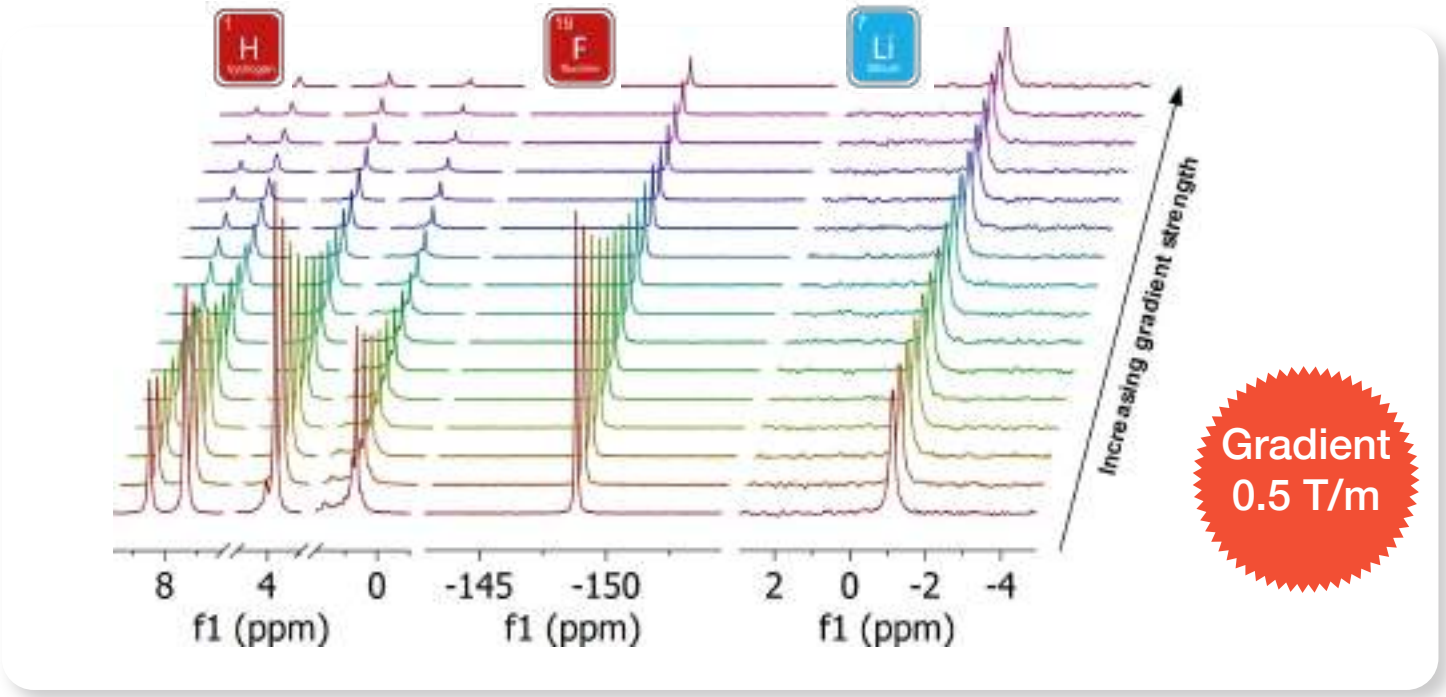




Diffusion Ordered Spectroscopy (DOSY) creates a two-dimensional plot by acquiring a set of spectra as a function of the amplitude of the gradient. The chemical shift is measured along the horizontal axis, and along the vertical axis the self-diffusion coefficient is shown. In this 2D spectrum the peaks are aligned along horizontal lines. Each of these lines corresponds to a different self-diffusion coefficient, and therefore a different component of the mixture. We can immediately separate the solvent peak, as well as the other two components, although their diffusion coefficients differ by a little more than 10%. This makes DOSY a very powerful tool for mixture analysis in NMR spectroscopy when the components have different diffusion coefficients.

Measurement of self-diffusion coefficients for different nuclei

As the Spinsolve can measure several nuclei on one instrument, the diffusion constants of the species containing the different nuclei can be measured automatically without any retuning. Below we show an example where we measure a mixture of 1-butyl-3-methylimidazolium tetrafluoroborate (BMIM-BF_4) and lithium tetrafluoroborate ($LiBF_4$). The diffusion coefficients were measured with a stimulated – echo sequence run for each particular nuclei. From left to right we can see the PGSTE experiments of 50 mg/mL LiBF4 in BMIM-BF_4 for proton, fluorine and lithium.



Spinsolve 80

Specifications

- Nuclei: ^{1}H, ^{19}F, ^{13}C, ^{31}P, ^{29}Si, ^{7}Li, ^{15}N, ^{11}B, ^{23}Na (more Available)
- Operating frequency: 80 MHz (^{1}H)
- ^{1}H Linewidth:
  - Classic 50 / 0.55% < 0.4 / 16 Hz
  - ULTRA 50 / 0.55 / 0.11% < 0.25 / 10 / 20 Hz NEW
- ^{1}H Sensitivity (dual channel): > 200:1 for 1% Ethyl Benzene
- External hardware Lock system / no need for deuterated solvents
- Available with automatic sample changer
- 3D PFG gradients optimized for gradient-assisted sequences
- Diffusion pulsed field gradients of 0.5 T/m NEW
- Standard 5 mm OD NMR sample tubes, 7” long
- Minimum sample volume: 250 ul
- Operating Temperature Range: 18° C to 28° C (65° F to 82° F)
- Dimensions: 58 x 43 x 40 cm (23” x 17” x 16”)
- Weight: 72.5 kg (160 lb)
- Stray Field: < 2 G all around system

Pulse sequences available on the Spinsolve 80 Carbon spectrometer

Proton	Fluorine	Carbon
1D proton (incl. Paramagnetic option)	1D Fluorine with ^{1}H decoupling	1D Carbon with ^{1}H and ^{19}F decoupling
1D solvent suppression	2D F - COSY	DEPT
1D with ^{19}F and ^{13}C decoupling	2D F - JRES	APT
2D gs-COSY*	2D FH - COSY	HETCOR
2D gs-TOCSY	T_1, T_2	gs-HSQC
2D gs-ROESY	PFG-DOSY	gs-HSQC-ME*
2D gs-JRES	Reaction Monitoring	gs-HMQC
T_1, T_2		gs-HMBC*
PFG-DOSY		
Reaction Monitoring		*Non-Uniform Sampling (NUS) available

Other sequences available, contact us!

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