BioSolids CryoProbe™

Game-changing Sensitivity Enhancement

The new BioSolids CryoProbe now allows for the advanced characterization of various biological solids, such as disease aggregates and large protein assemblies, with a threefold boost in sensitivity at physiological temperatures. Such a sensitivity enhancement reduces the measurement time by one order of magnitude thereby increasing productivity. In addition, the new BioSolids CryoProbe allows for the exploration of more challenging experiments for samples with low labeling content, or even in natural abundance, which are impractical to perform with conventional room temperature probes.

The probe is designed for challenging solid state NMR experiments, notoriously requiring strong RF fields and long spin-lock times. The improvement in sensitivity given by the cold electronics and RF coil allows for the application of traditional solid state NMR methods for challenging samples, expanding the possibilities of the researchers and opening the way to a new era for solid-state NMR.

The BioSolids CryoProbe is available in triple resonance configuration (HCN) at 600 MHz.

Key features:

- X-channel mass sensitivity enhanced by a factor of > 3. Total sensitivity can be up to 10 times higher than with conventional room-temperature MAS probes.
- One order of magnitude faster data acquisition and significantly increased productivity
- Support biosolids experiments with strong B_1 fields (CP, decoupling) and long spin-lock times (CP, double CP)
- Automatic tuning, matching and magic angle adjustment and lift-assisted sample exchange
- MAS rates up to 20 kHz with specially designed 3.2 mm rotors
- All this into a standard bore design

The BioSolids CryoProbe was conceived to grant researchers the means to study challenging biological systems without altering their sample composition. This feature is extremely important when it comes to biological systems, as the surrounding of proteins, being the cell membrane or other partner molecules forming a complex, is often crucial to maintain their biological function.

The sample temperature can also be regulated independently from the NMR coil temperature, avoiding relaxation and add tional broadening, typical of low temperature MAS experiments.

Dilute samples, such as labelled proteins in their native environment, small molecules in large assemblies, and samples in natural abundance or with low level of labeling, greatly benefit from the significant boost in sensitivity of this innovative probe.

Fields of Application:

Biopolymers

- Amyloid fibrils and prions
- Large protein assemblies
- Membrane proteins
- Proteins in native environment
- In-cell studies

Natural products

- Degradation of wood caused by fungal diseases

Material science

- Nanocarriers
- Metal-organic frameworks
- Cellulose and amorphous systems

Pharma

- Polymorphisms
- Advanced characterizations of APIs

Faster Data Acquisition

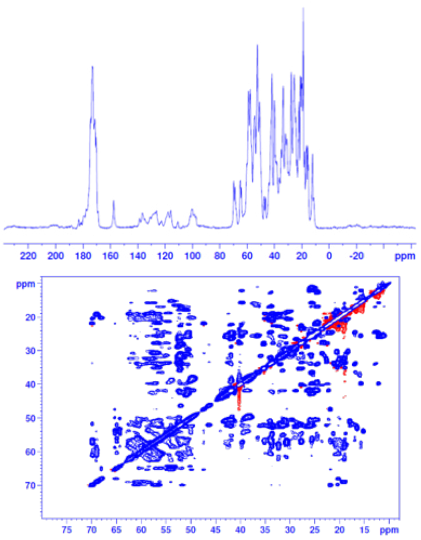

Figure 1: 2D $^{13}C^{13}C$ DARR correlation recorded in 1 hour. ~ 96.7 mg (u- 13C, 15N) HET-s (218-289) prion domain (courtesy of A. Loquet, CNRS, Bordeaux, France).

Gain One Dimension

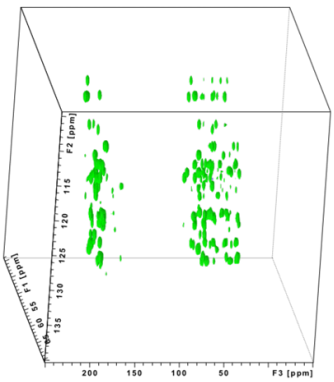

Figure 2: 3D CaNCO correlation recorded in 1 night on the same sample. The spectrum was acquired with 4 scans, as 1362×42 ×72 complex matrix and the total experiment time was just 7 hours and 5 minutes. This is the typical amount of time required to run an equivalent 2D experiment on a room temperature probe

Bruker BioSpin

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