SPECIFICATIONS

High-performance digital NMR spectrometer

1. Magnet

Actively shielded superconducting magnet with 5.4 cm bore, operating at 9.39 Tesla
Magnet equipped with pneumatic vibration dampers, helium and nitrogen level meters, room temperature shim system

2. Probes

a. All probes must be capable of variable temperature operation from -150 to +200 ^{o}C

b. System must include all necessary accessories such as LN2 dewar, heat exchanger, transfer line, etc, and computer control over VT operation.

c. Probes must feature automatic tuning and matching and computer selection of X-nucleus.

d. A high resolution quad-nuclear probe for 5 mm sample tubes, pretuned for 13C, 31P, and 19F, with 2H lock channel and outer coil for 1H detection or decoupling, and actively shielded z-axis gradient and/or a broadband high resolution probe tunable from 31P to 15N and a high frequency (1H- 19F) decoupling/observe coil, with deuterium lock channel, and automatic tuning and matching to each nuclei.

e. A multinuclear broadband high resolution probe for 10 mm samples with inner coil tunable to 19F or any nucleus between 31P to 103Rh observe; outer coil tuned for 1H decoupling, and equipped with 2H lock channel, and z-axis gradient.

f. Inverse triple resonance for 5 mm sample tubes for observing 1H while decoupling 13C and 15N, including 2H lock and z-axis gradient.

3. RF amplifiers/receiver

a. Must have necessary RF channels for above probes, at least 150W (31P to 15N)/50W (1H to 19F) over 12-420 MHz

b. Deuterium modules for 2H decoupling and X, Y, Z-gradient shimming.

c. Phase switching, amplitude switching, frequency switching of 25 ns, timing resolution 12.5 ns, minimum pulse length 25 ns, minimum delay 25 ns, phase resolution 0.01 degree, frequency resolution 0.005Hz.

d. 22-bit dynamic range on receiver

e. Real time digital filtering up to 5 MHz bandwidth

f. Stainless steel cabinet for console electronics

4. Workstation/software

a. Computer system and software for complete spectrometer control and data processing with 19-inch or larger monitor, suitable printer

b. Three extra data processing licenses

5. Installation/support

Must include site visit to power down and remove existing magnet and console, in addition to complete installation of new system, including magnet, and set up of instrument to demonstrate operation to manufacturers' specifications. User training course must be provided for at least one person.