

Nuclear Magnetic Resonance Facility
Exhibit A

Location: 194 and 196 Kolthoff Hall

Mailing address: 207 Pleasant St. SE, Department of Chemistry, U of M, Minneapolis, MN 55455

NMR web page: <http://nmr.chem.umn.edu>

Contact:

Dr. Letitia J. Yao

612-625-8374

letitia@nmr.chem.umn.edu

Facilities:

The NMR laboratory provides access to modern spectroscopic techniques for analysis of compounds ranging from small molecules (e.g., synthetic intermediates and organometallic compounds) to polymers. The facility houses six solution-state spectrometers, ranging in field strength from 300 to 500 MHz. Three of these are equipped with autosamplers for routine use. The remaining instruments are operated in "hands-on" mode and permit a wider range of experiments, variable temperature capability, and longer experiment times. Many different nuclei may be observed, though ^1H and ^{13}C are the most common.

Guidelines for sample preparation:

Samples to be analyzed by personnel in the NMR laboratory should be delivered to the NMR lab in a 5 mm NMR tube dissolved in an appropriate *deuterated* solvent such that the height of the sample in the tube is 5 cm (~ 0.7 mL total volume) for Varian spectrometers or 4 cm (0.55 mL solvent) for Bruker spectrometers. We recommend 507 quality tubes for the 300 MHz instruments and 528 quality tubes for the 500 MHz instruments. If you do not have NMR tubes or solvents, we can provide them for you at our cost. Samples run on the 300 autosampler must be in *eight (8) inch* 5 mm NMR tubes. 7, 8 or 9-inch 5 mm tubes may be used on all other systems.

The parameters for the hands-on instruments can be adjusted according to individual needs.

Rates:

We bill according to the field strength of the instrument used *plus* an operator charge for the amount of time required to set up, process, and plot the spectrum. Please provide us with a billing address and PO number (if required by your company). The university does not accept credit card payments.

500 MHz:	\$96.00/hour
400 MHz:	\$84.00/hour
300 MHz:	\$69.00/hour
500 MHz autosampler:	\$32.00/spectrum (includes operator charge)
400 MHz autosampler:	\$27.00/spectrum (includes operator charge)
300 MHz autosampler:	\$23.00/spectrum (includes operator charge)
OPERATOR CHARGE:	\$135.00/hour

Sample Submission forms are available from our website and must be included with all samples.

Results can be picked up in person, faxed or mailed as hard-copies or provided as electronic raw data files or in PDF format. Once the service is completed, NMR personnel will return any unused substance to the Company if so requested.