

Lab #1 Problem Set:

Due Date: please hand in at the beginning of Lab #2 (late assignments are penalized 0.5 points/day)

If you have any problem getting time on DRX300, logging-in, finding the sample, collecting data, processing data, analyzing data or plotting data, please see either Mark Girvin or Sean Cahill.

1. Collect a 1D ^1H spectrum of menthol sample on DRX300 nmr instrument and process with EM (exponential multiply) window (LB=0.3 hz). Plot region from 6 to 0 ppm.
2. Same as #1 but plot out region from 2.8 to 2.4 ppm.
3. Same as #2 but process with GM (gaussian multiply) window (LB= -2, GB= 0.9). In what way are the spectra from the EM window and the GM window different?
4. Same as #1 but plot out region from 1.5 to 0.5 ppm. Identify the doublets from the three methyl groups in menthol. Explain why the methyl signals are doublets. What are the coupling constants of the doublets?
5. Same as #1 but plot region from 4.0 to 1.5 ppm. Identify the signal from the $-\text{CH}\underline{\text{O}}\text{H}$ proton of menthol (hint: refer to lecture on chemical shifts: "Shoolery's Constants: Empirical Correlations for Chemical Shifts" to calculate approximately where methine proton will appear assuming ring behaves as two methyls, $(\text{CH}_3)_2\text{C}\underline{\text{H}}\text{OH}$). Explain splitting of signal.