

DEPT SPECTROSCOPY OVERVIEW

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DEPT - Distortionless Enhancement by Polarization Transfer. DEPT experiments are used for the observation of nuclei with small gyromagnetic ratios, which are J-coupled to ^1H (most commonly ^{13}C). DEPT is a spectral editing sequence, that is, it can be used to generate separate ^{13}C subspectra for methyl (CH_3), methylene (CH_2), and methine (CH) signals. DEPT makes use of the generation and manipulation of multiple quantum coherences to differentiate between the different types of ^{13}C signals. Quaternary carbons are missing from DEPT spectra because the large one-bond heteronuclear J-coupling (J_{CH}) is used for polarization transfer.

DEPT 135 – yields spectra with CH and CH_3 signals in opposite phase to CH_2 signals.

DEPT 90 – yields spectra with only CH signals.

DEPT 45 - yields spectra with positive CH, CH_2 , and CH_3 signals (all protonated carbons).

Additional information can be found in the TopSpin Menu [Help]>[NMR GUIDE]

Experiment	Parameter Set	Pulse Program	Default NS
DEPT 135	C13DEPT135	dept135	256
DEPT 90	C13DEPT90	dept90	256
DEPT 45	C13DEPT45	dept45	256

You can run fewer scans than the default **ns** of 256.

Summary of Methodology:

1. Tune, Lock and Shim.
2. Acquire 1D ^{13}C spectrum,
3. Reacquire 1D ^{13}C spectrum with reduced sweep width. Determine the number of scans required.
4. Load desired DEPT parameter set.
5. Adjust parameters as necessary (reference, sweep width, transmitter frequency, number of scans, number of points)
6. Type **getprosol**.
7. Set receiver gain (**rga**) and acquire (**zg**).
8. Transform data (**ef**) and process (**apk**, etc.).

1. Tune and shim.

- a. Check that the spinning is shut off.
- b. Shim the magnet: X, Y, Z1-Z5
- c. Tune both ^1H and ^{13}C channels.

2. Collect a good 1D ^{13}C spectrum.

- a. Acquire a 1D ^{13}C spectrum and reference. Zoom in and display all carbon signals leaving 0.5 ppm of baseline on each side. Type **setsw** to set the transmitter offset (**o1p**) and sweep width (**sw**). Reacquire “reduced-sweep width spectrum with the number of scans (**ns**) needed to get good signal to noise, and phase.

Write down the following values:

o1p:_____

sw:_____

sr:_____

ns:_____

3. Load DEPT parameter set.

Experiment	Parameter Set	Pulse Program	Default NS
DEPT 135	C13DEPT135	dept135	256
DEPT 90	C13DEPT90	dept90	256
DEPT 45	C13DEPT45	dept45	256

- a. Check pulse program under the AcqPars tab. In the drop down menu for AQ-mod, change DQD to qsim.
- b. Load the prosol parameters by typing **getprosol**.

- c. Edit the basic parameters (**o1p**, **sw**, **sr** and **ns**) based on the information from the 1D ^{13}C spectrum experiment.
- d. Set receiver gain **rga** and acquire **zg**.

4. Data Processing

- a. Fourier Transform the data with **ef**.
- b. Autophase the data by typing **apk**.
- c. Print out your final spectrum!

