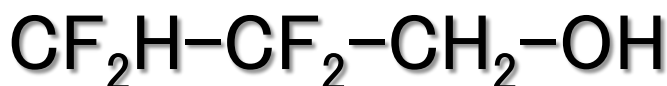


## Determine number of protons attached to each carbon in fluorine-containing compounds by $^{13}\text{C}$ NMR spectroscopy!

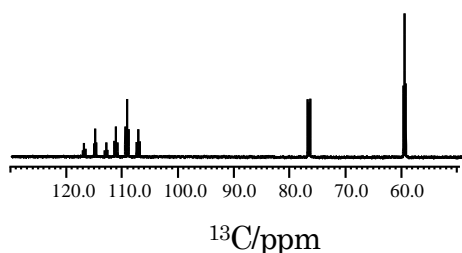
Product used : Nuclear Magnetic Resonance (NMR)

We usually use DEPT135 (Distortionless Enhancement by Polarization Transfer) experiment to analyze  $^{13}\text{C}$  multiplicity. In the case of fluorine-containing compounds, not only  $^1\text{H}$  decoupling but also  $^{19}\text{F}$  decoupling is efficient.  $J_{\text{CF}}$  are larger than  $J_{\text{CH}}$ , and so  $^{13}\text{C}$  peaks are often affected even by long-range couplings. In such instances, we can achieve the maximum sensitivity and singlet signals by  $^{13}\text{C}$  measurement with simultaneous  $^1\text{H}$  and  $^{19}\text{F}$  decoupling. The figures below show  $^{13}\text{C}$  and DEPT spectra of 20% 2,2,3,3-tetrafluoropropanol in  $\text{CDCl}_3$ . You can see that  $^{13}\text{C}$  and DEPT spectra are simplified with  $^{19}\text{F}$  decoupling.

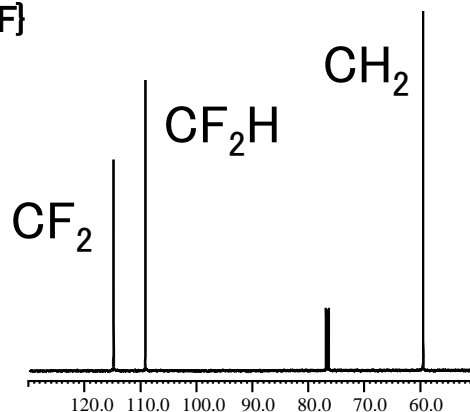


ROYALPROBE HFX can perform these  $^1\text{H}$ ,  $^{19}\text{F}$ ,  $^{13}\text{C}$  triple-resonance measurement, even with a standard 2-channel console!

$^{13}\text{C}\{^1\text{H}\}$



$^{13}\text{C}\{^1\text{H}, ^{19}\text{F}\}$

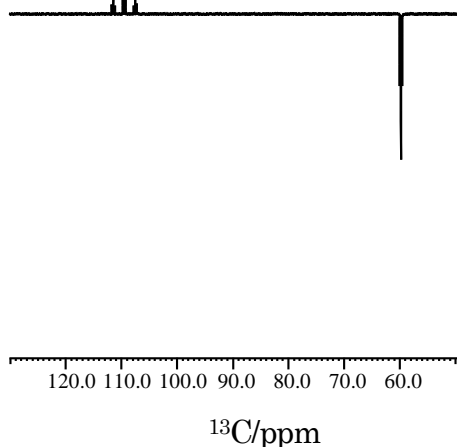


Add  $^{19}\text{F}$  dec

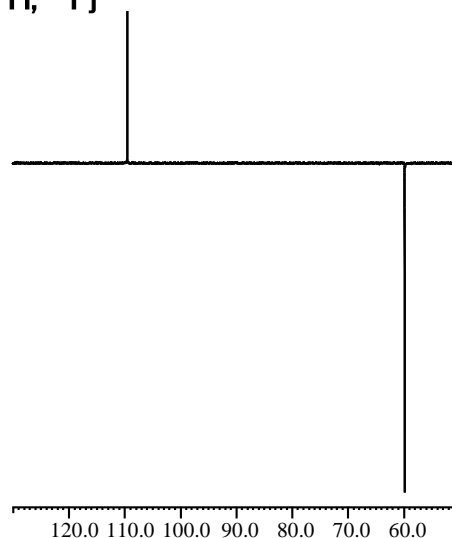


$^{13}\text{C}\{^1\text{H}\}$  and  $^{13}\text{C}\{^1\text{H}, ^{19}\text{F}\}$  spectra, 64 scans

DEPT135 $\{^1\text{H}\}$



DEPT135 $\{^1\text{H}, ^{19}\text{F}\}$



Add  $^{19}\text{F}$  dec



DEPT and DEPT  $\{^{19}\text{F}\}$  spectra, 32 scans

console : JNM-ECZ500R, ROYALPROBE HFX

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