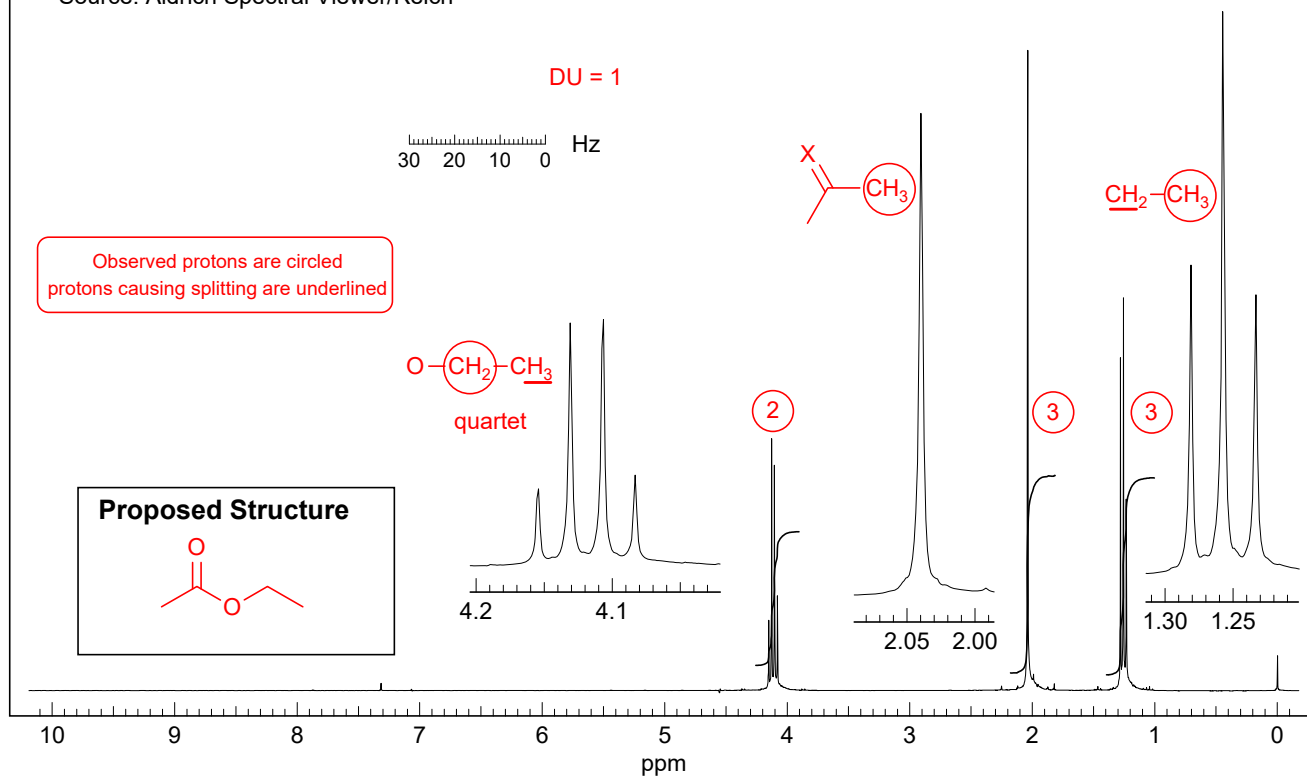


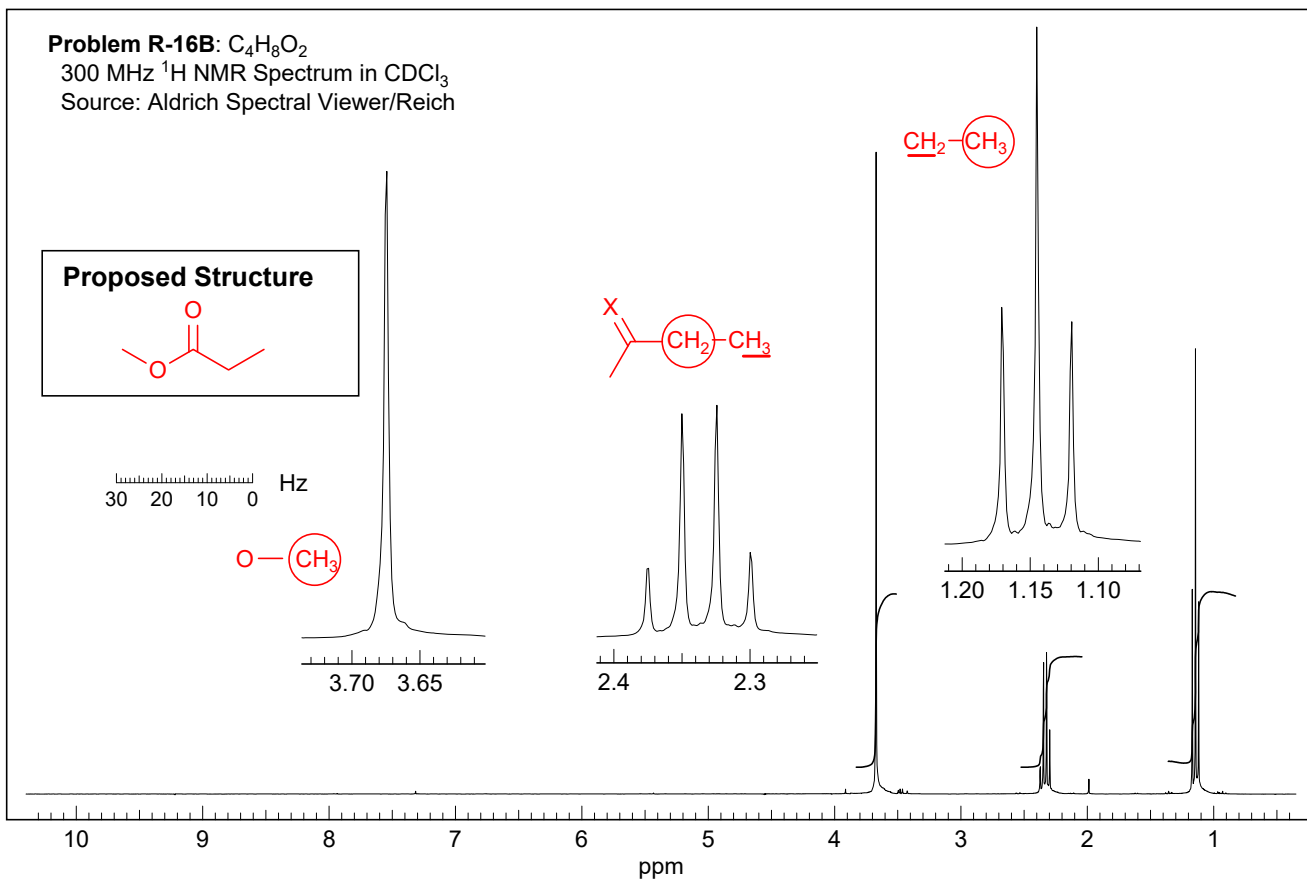
Problem Set 1
Two Isomers of C₄H₈O₂

Reich
 Chem 345
 Chem 605

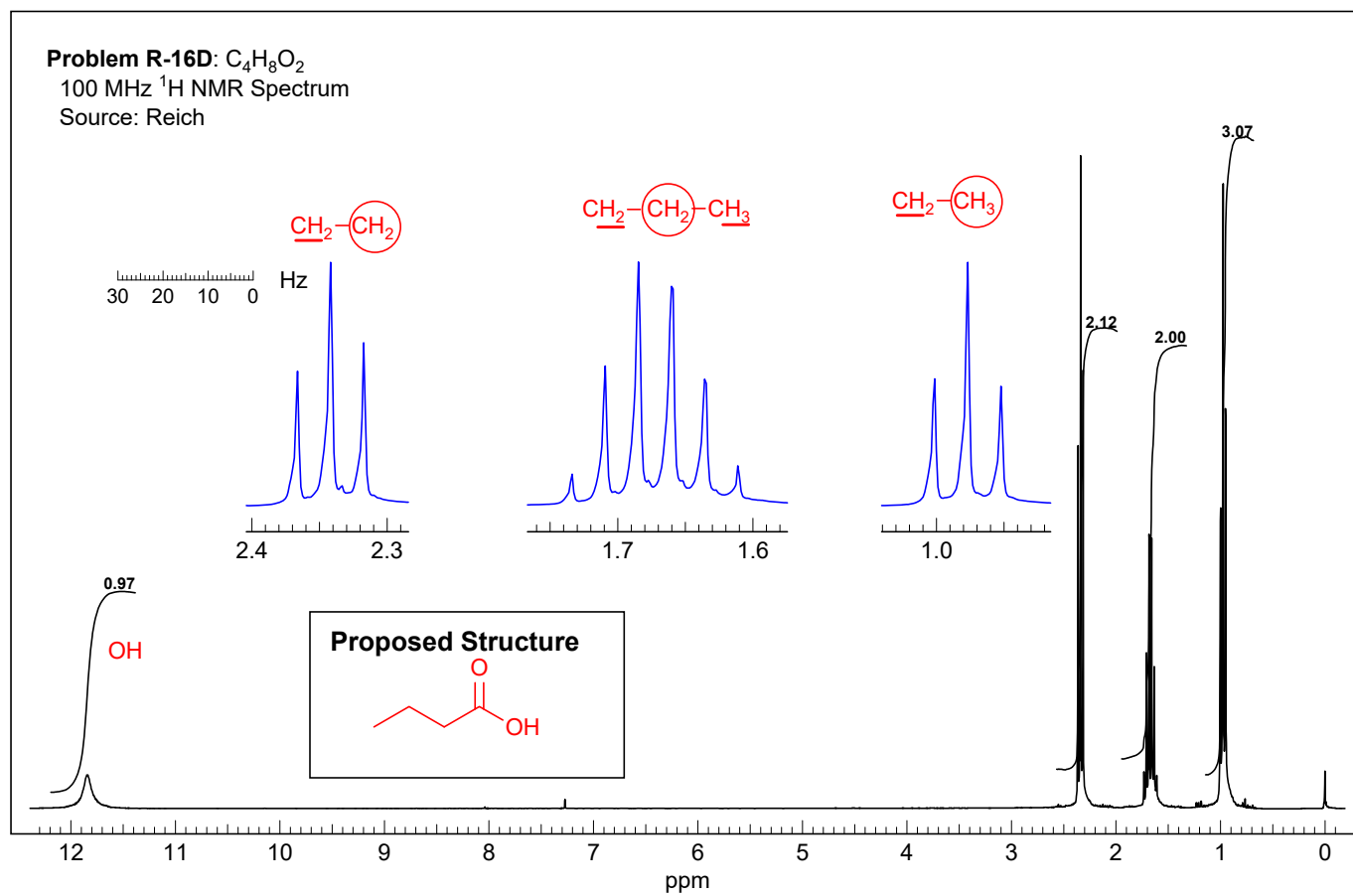
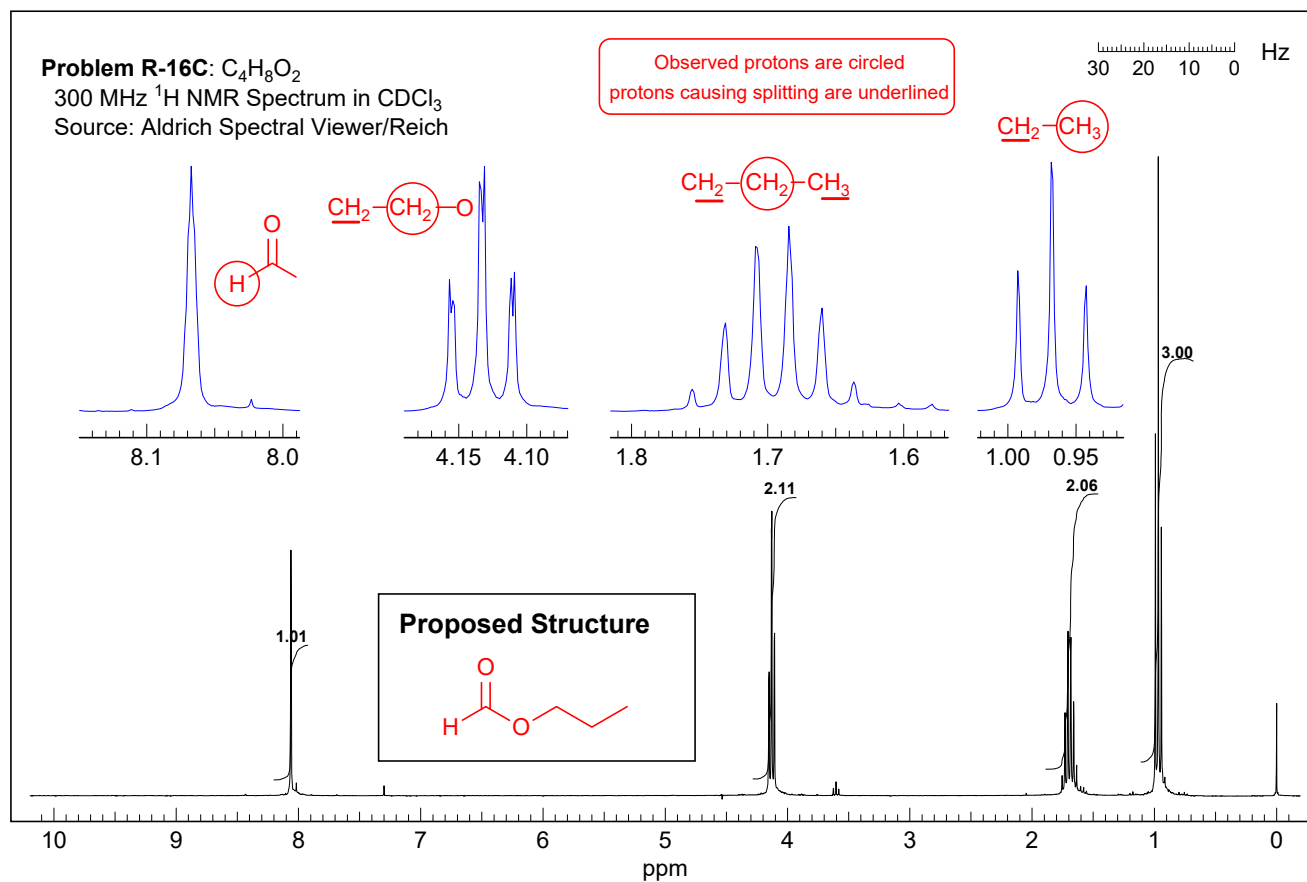
Problem R-16A: C₄H₈O₂
 300 MHz ¹H NMR Spectrum in CDCl₃
 Source: Aldrich Spectral Viewer/Reich



Problem R-16B: C₄H₈O₂
 300 MHz ¹H NMR Spectrum in CDCl₃
 Source: Aldrich Spectral Viewer/Reich



Two Isomers of C₄H₈O₂



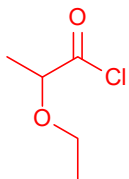
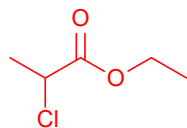
Problem R-27K C₅H₉ClO₂

250 MHz ¹H NMR spectrum in CDCl₃

Source: Adam Fiedler/Reich

DOU = 1

Proposed Structure

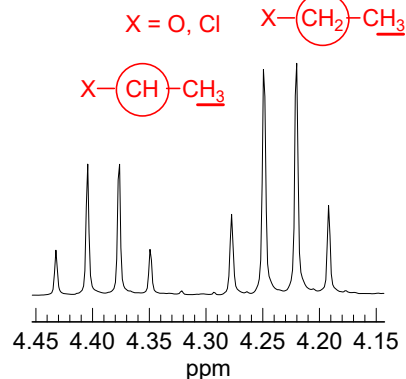


This is a reasonable alternative structure - also fits the ¹H NMR data

Observed protons are circled
protons causing splitting are underlined

CH-CH₃

CH₂-CH₃



2.16

1.00

1.70 1.65 ppm

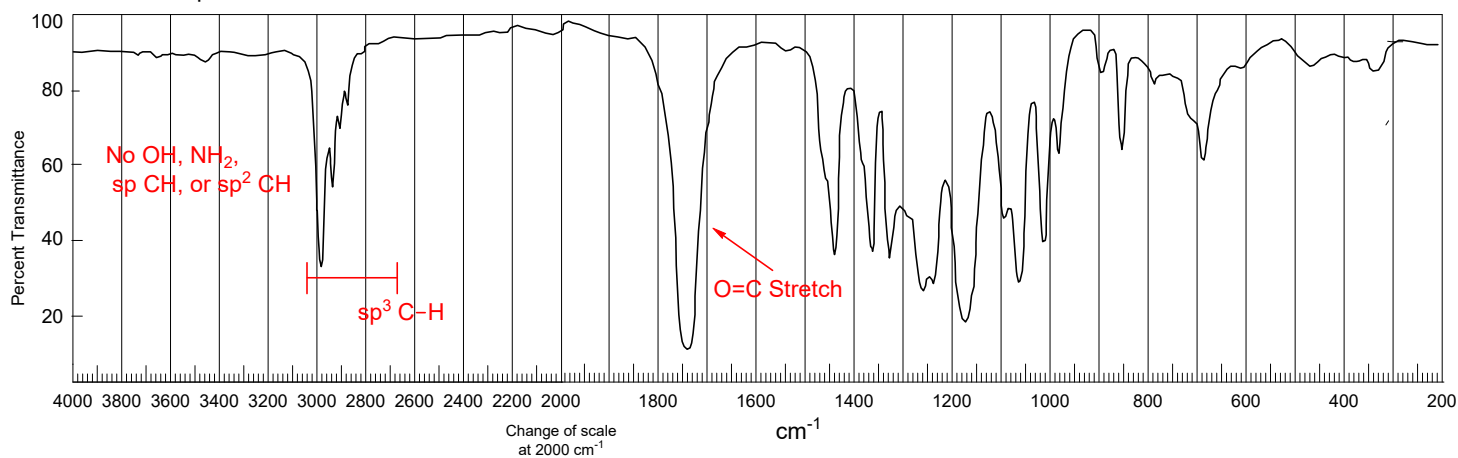
3.26

3.13

1.35 1.30 1.25 ppm

ppm

Infrared Spectrum:

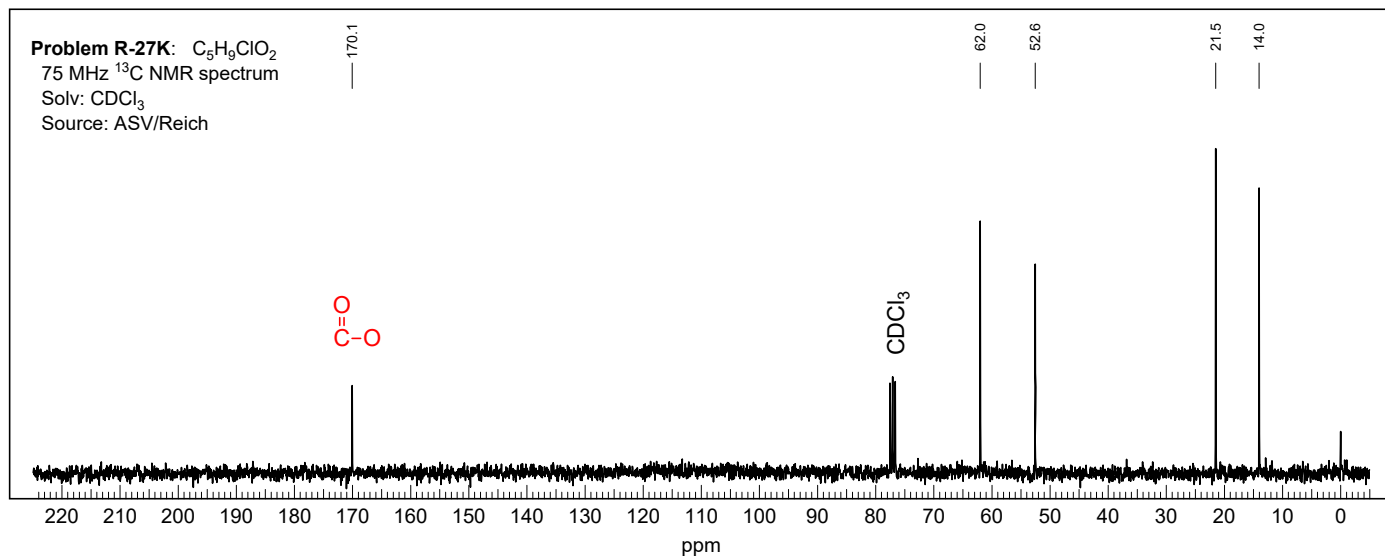


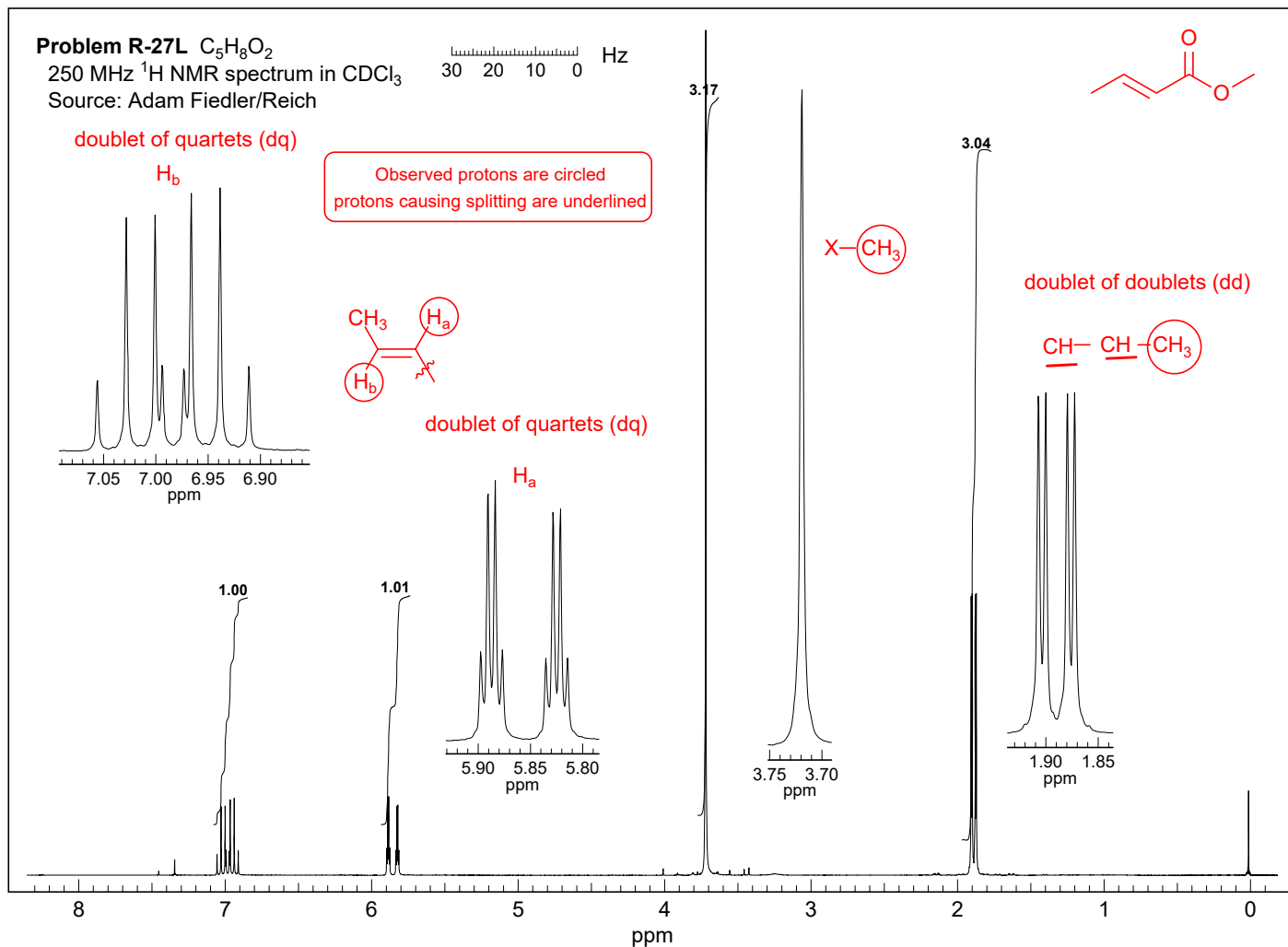
Problem R-27K: C₅H₉ClO₂

75 MHz ¹³C NMR spectrum

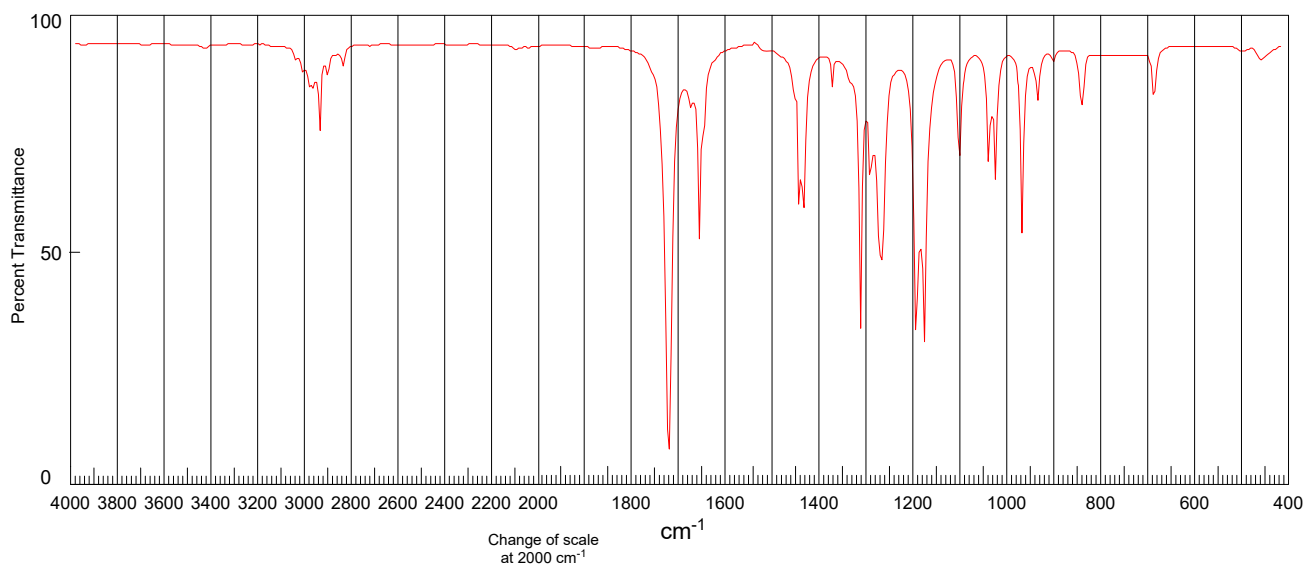
Solv: CDCl₃

Source: ASV/Reich





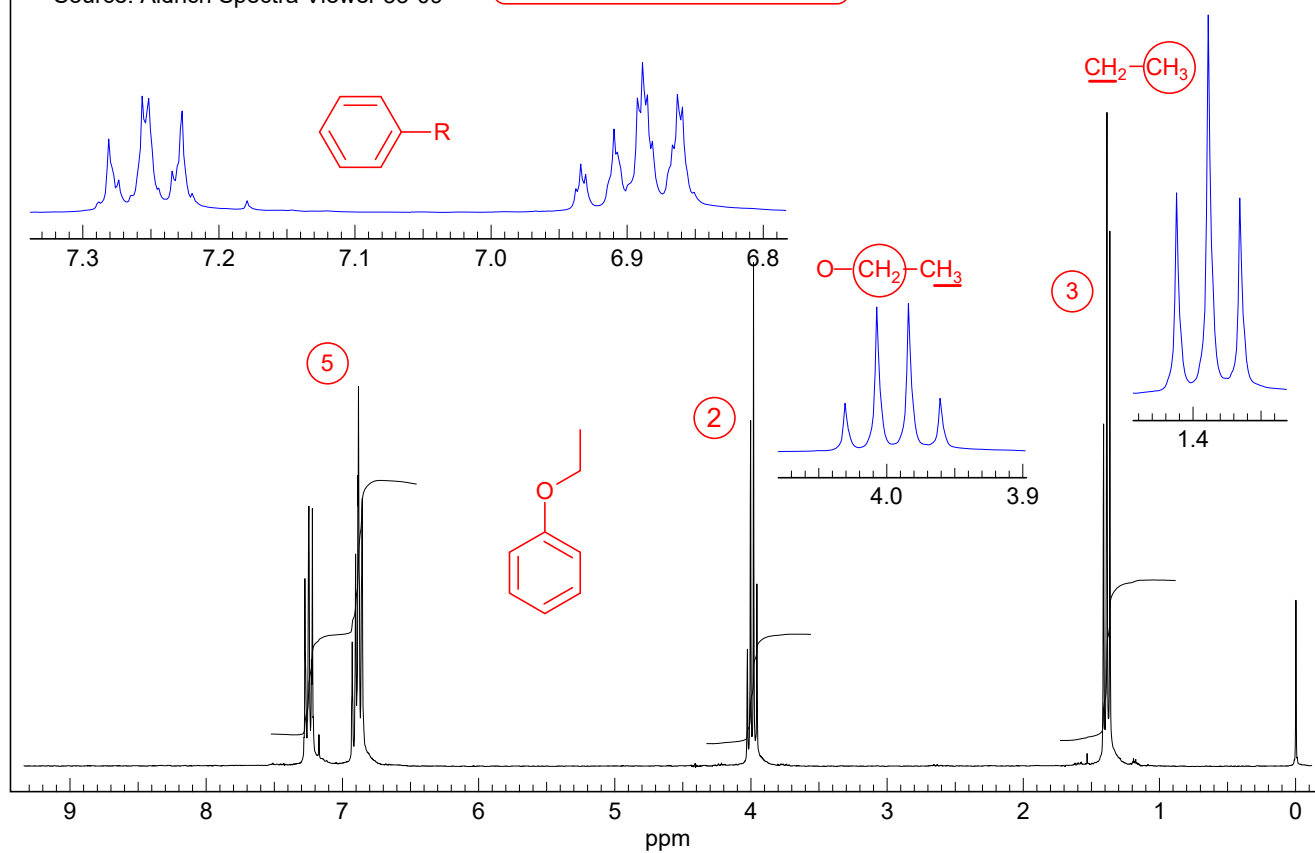
Infrared Spectrum (CCl_4 solution, Source: SDBS):



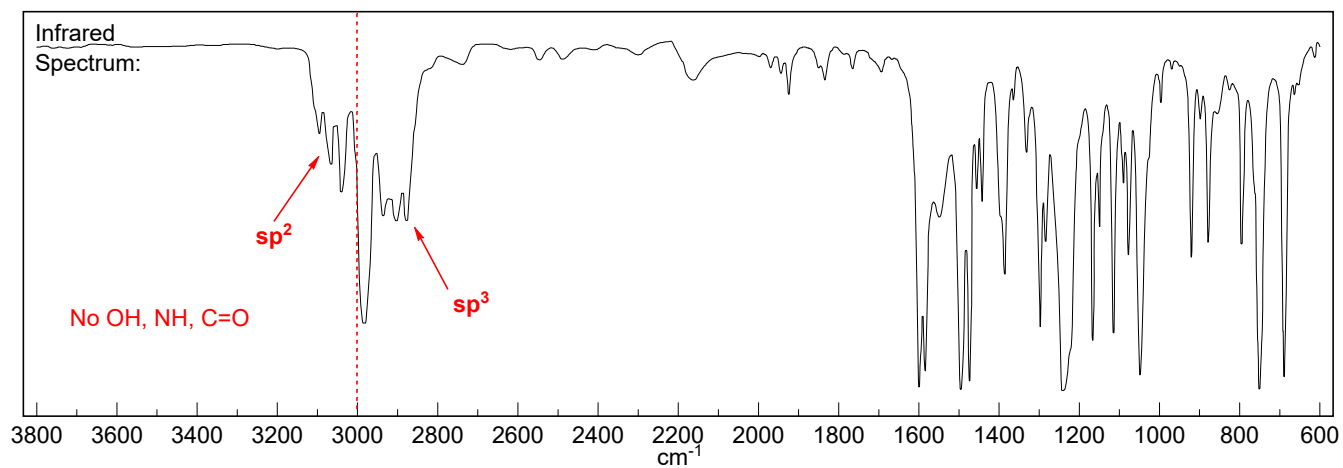
Problem R-27N $C_8H_{10}O$
 300 MHz 1H NMR spectrum in $CDCl_3$
 Source: Aldrich Spectra Viewer 33-09

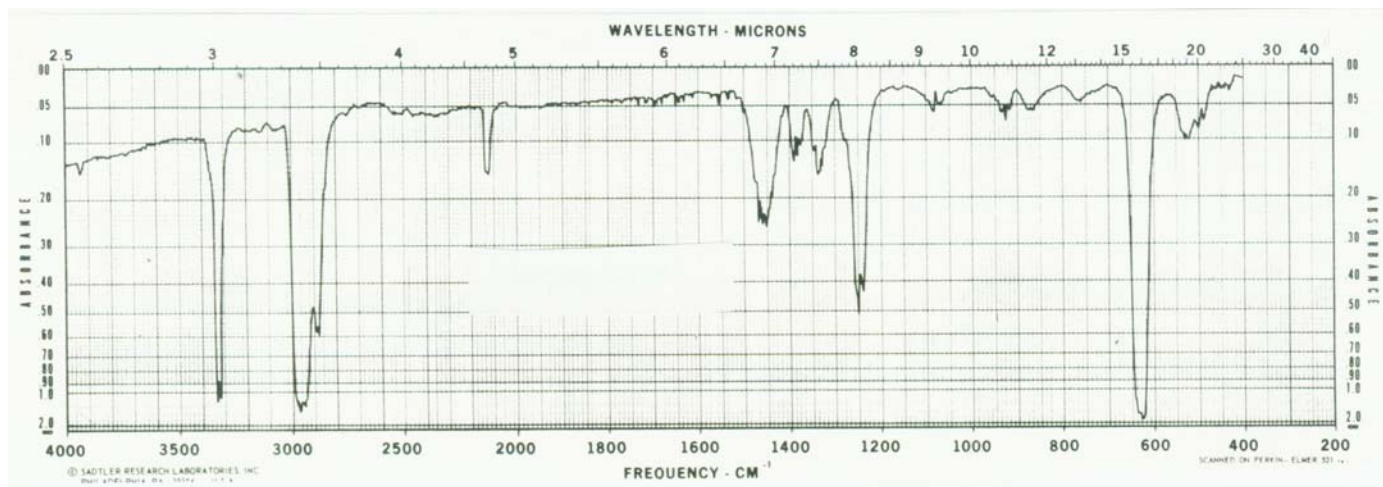
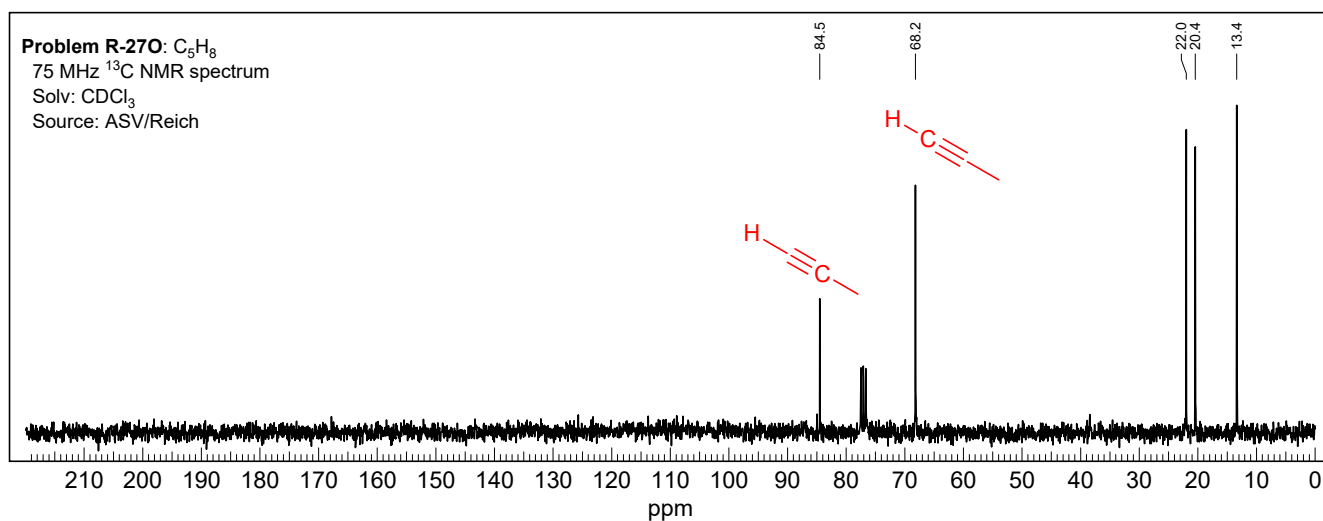
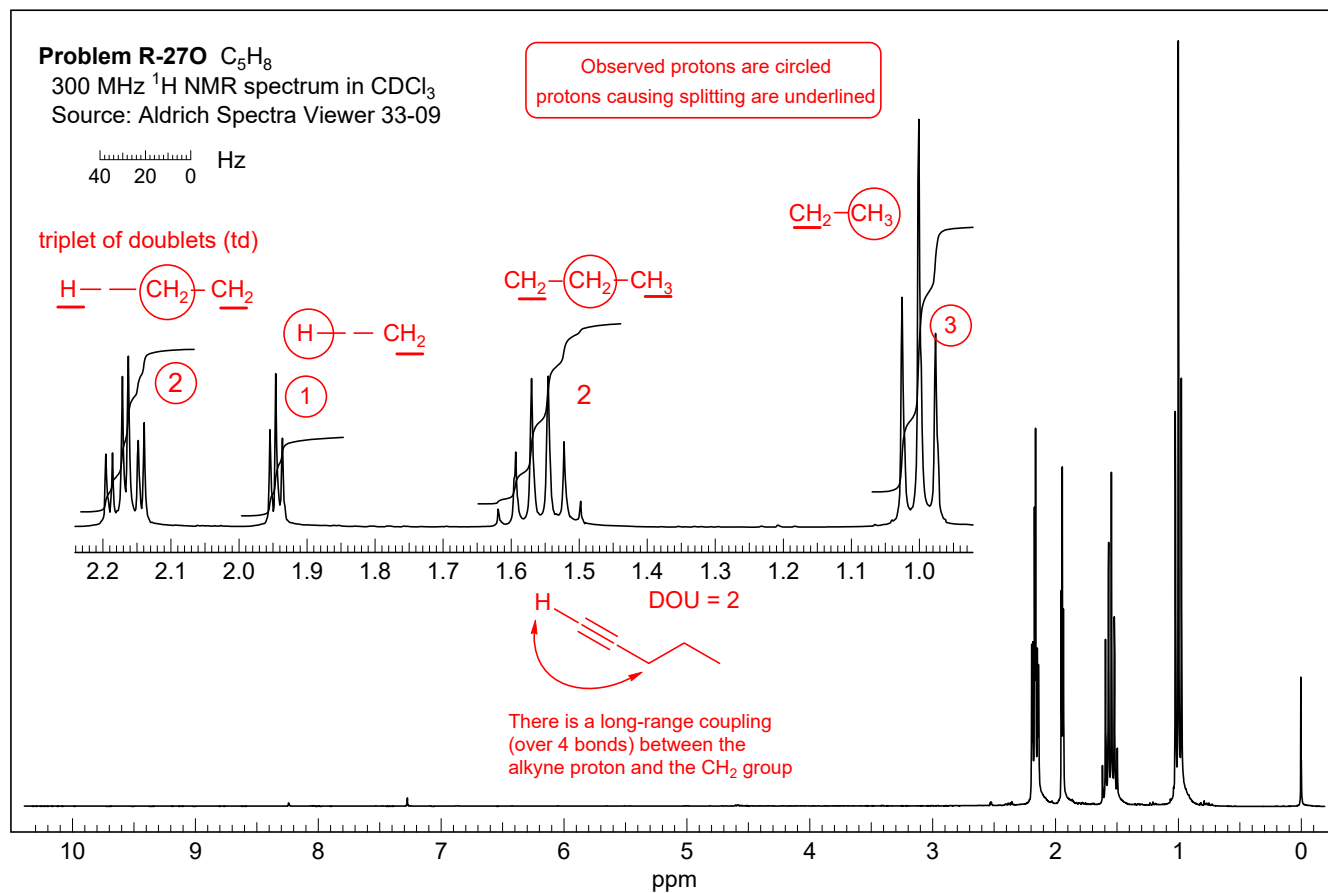
Observed protons are circled
 protons causing splitting are underlined

30 20 10 0 Hz

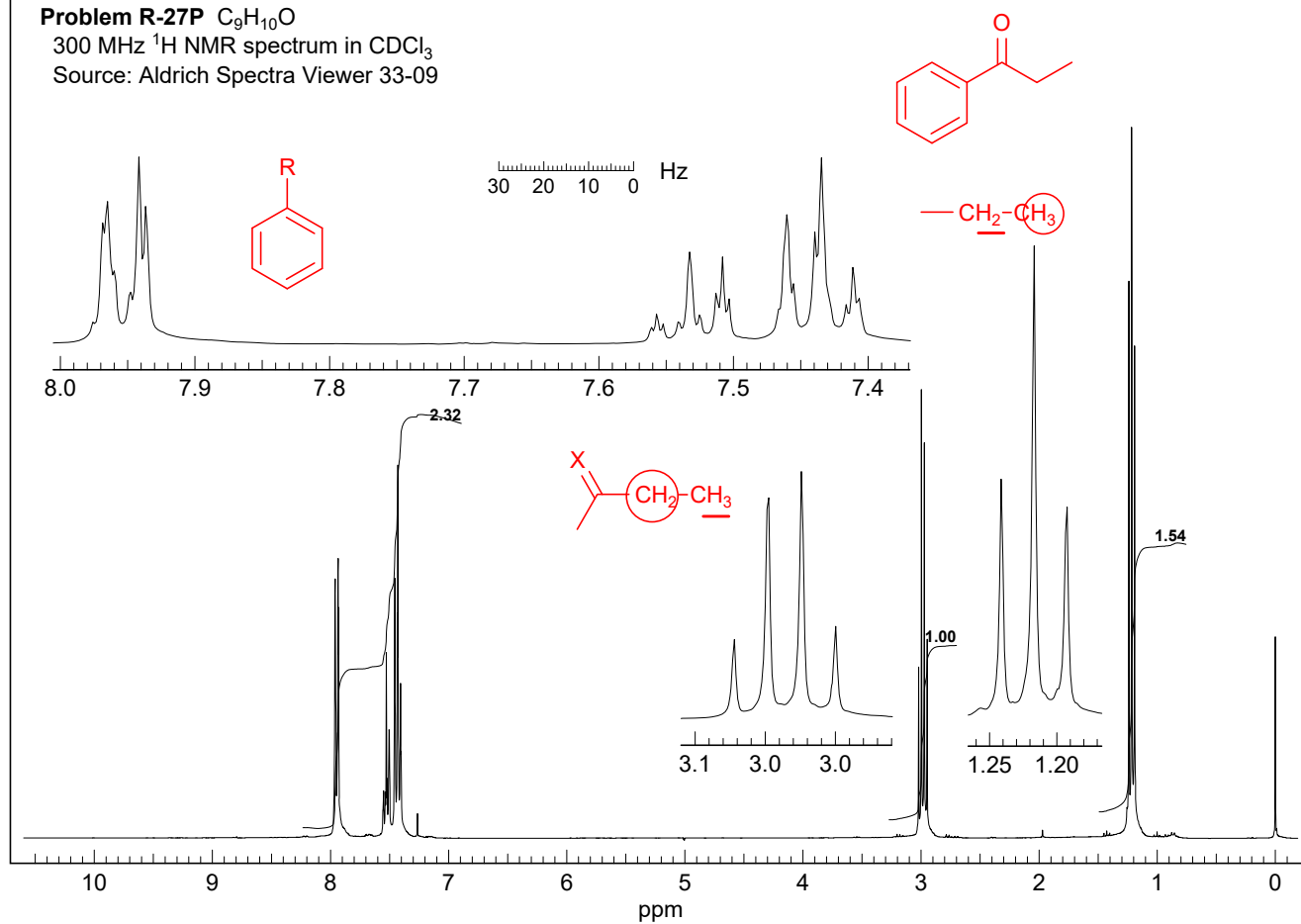


Infrared
 Spectrum:

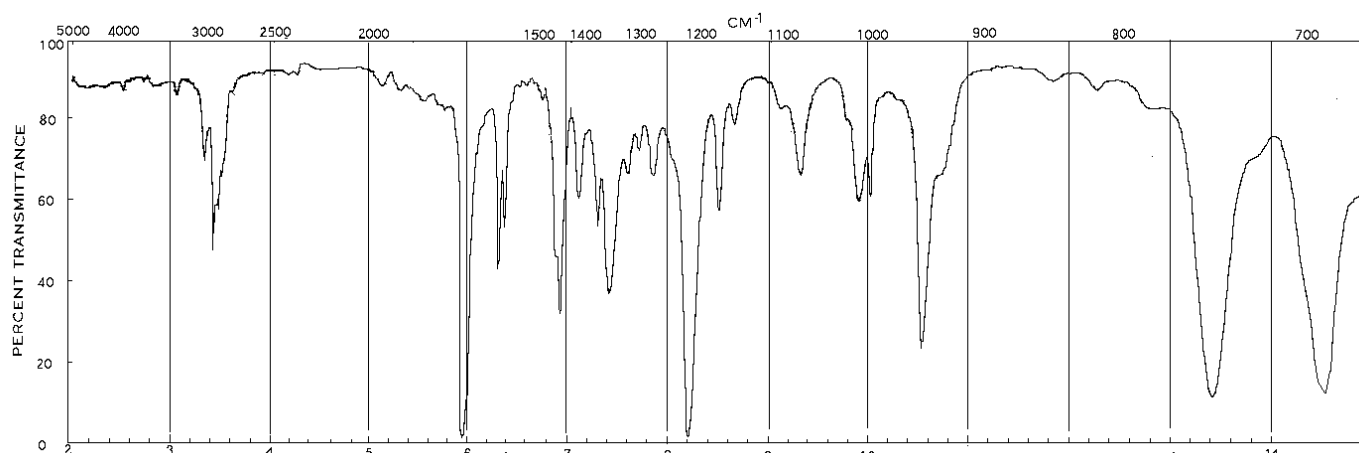




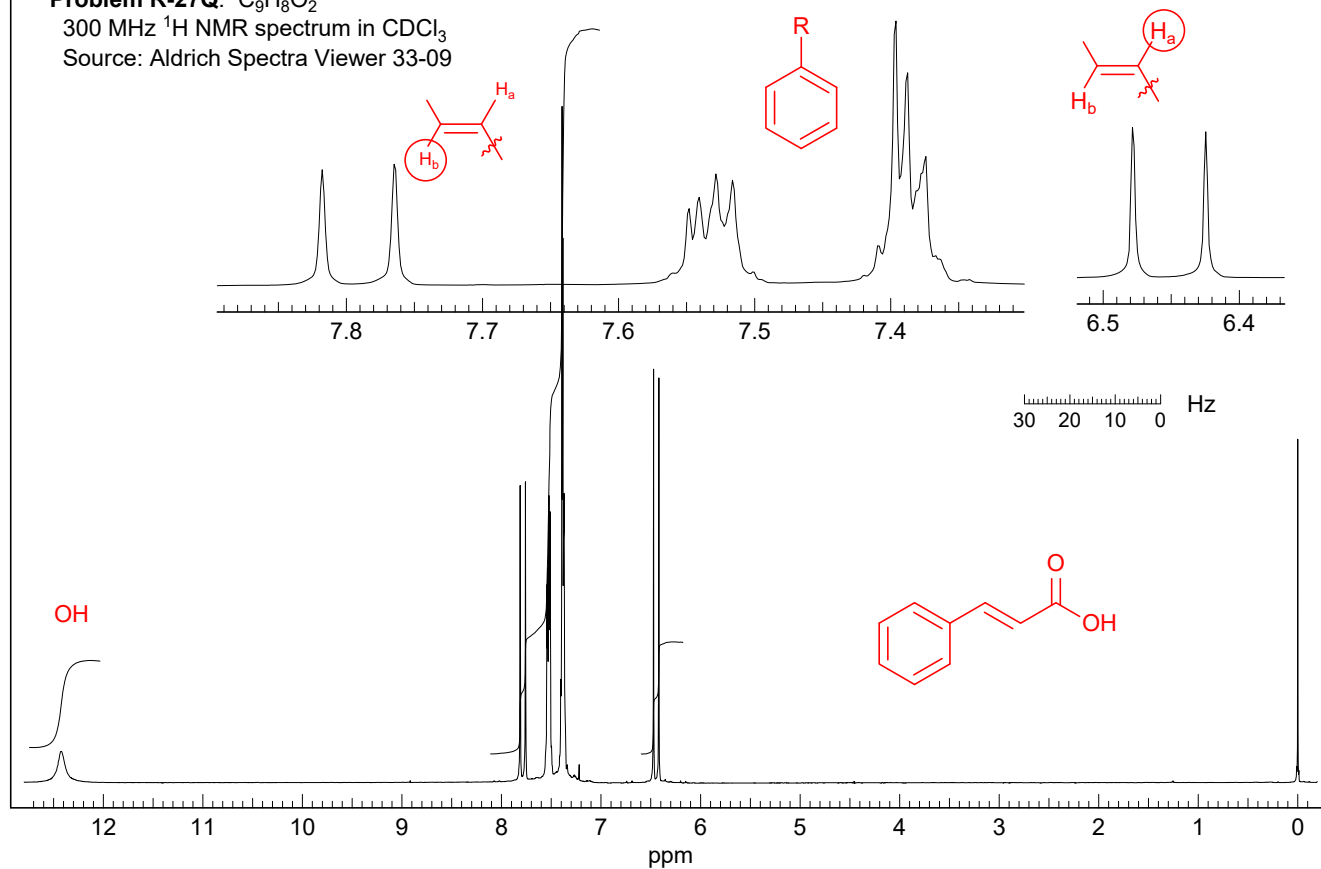
Problem R-27P C₉H₁₀O
 300 MHz ¹H NMR spectrum in CDCl₃
 Source: Aldrich Spectra Viewer 33-09



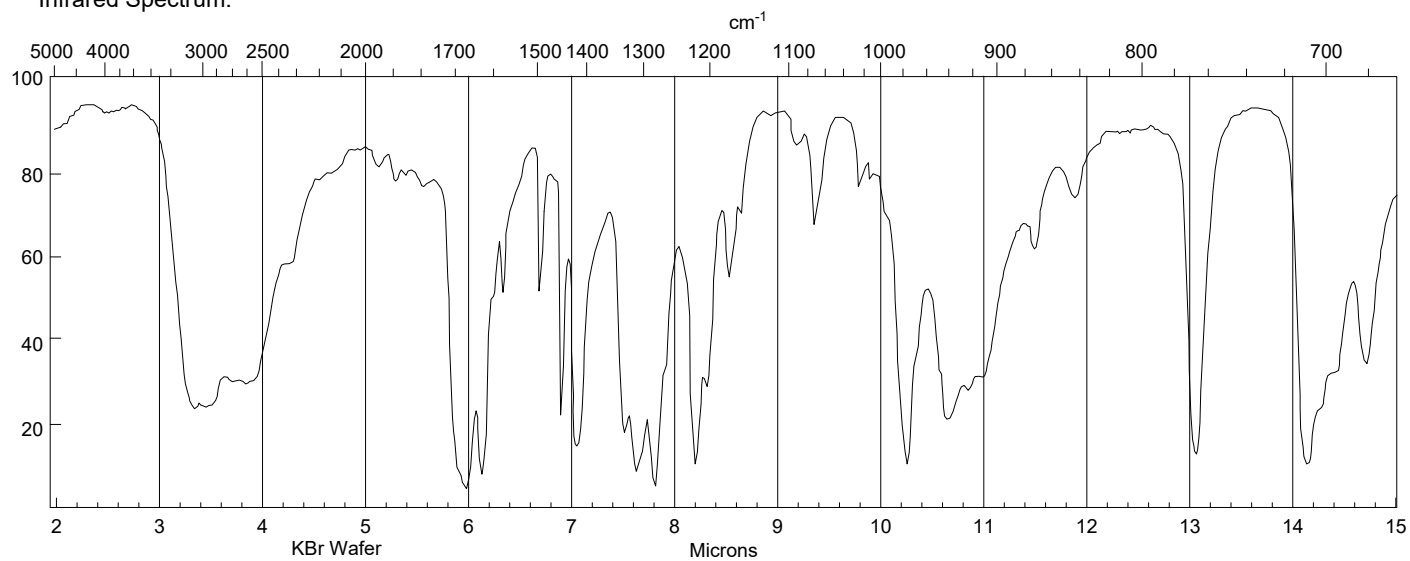
Infrared Spectrum:



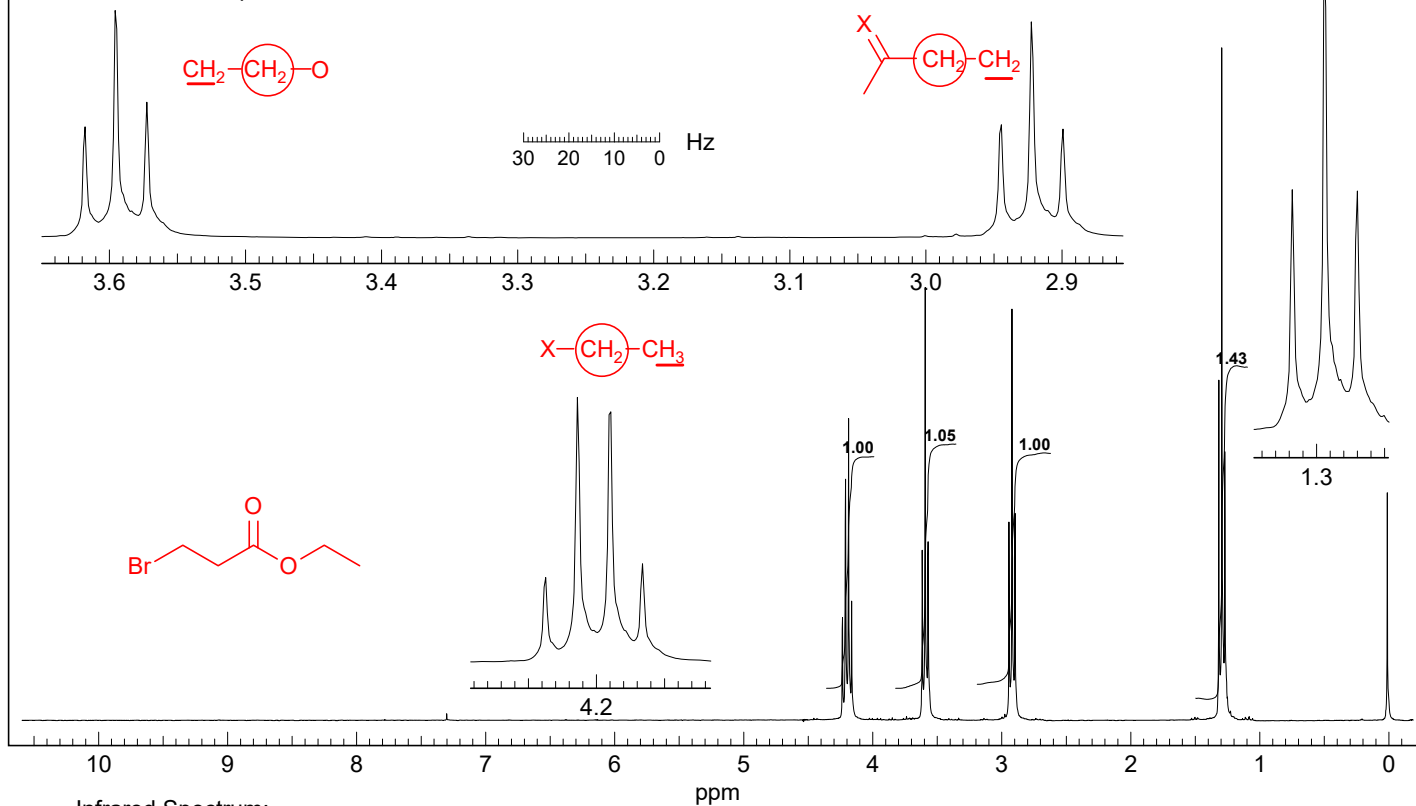
Problem R-27Q: $C_9H_8O_2$
 300 MHz 1H NMR spectrum in $CDCl_3$
 Source: Aldrich Spectra Viewer 33-09



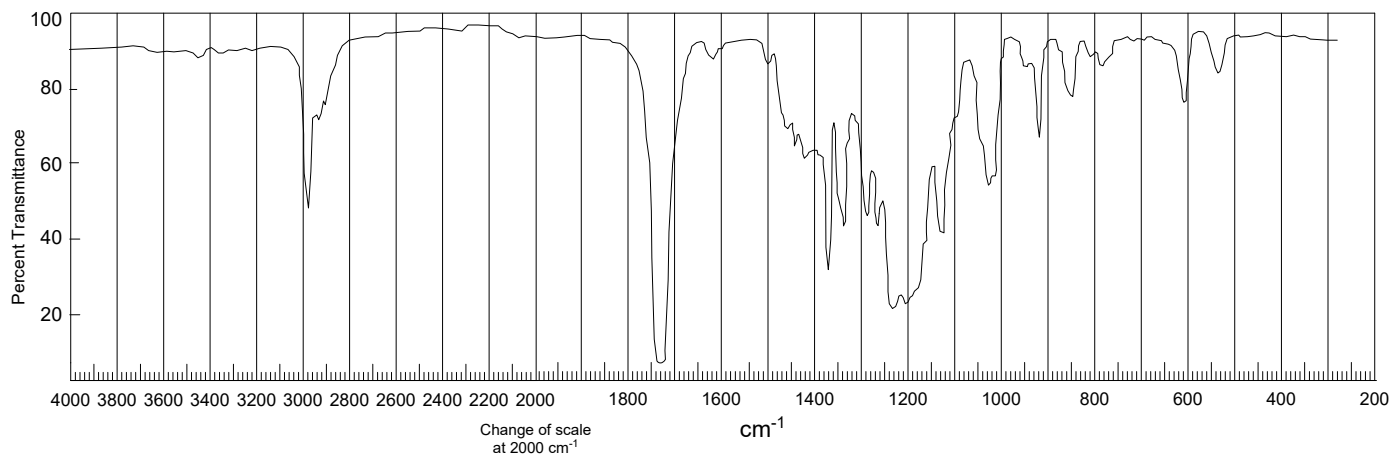
Infrared Spectrum:



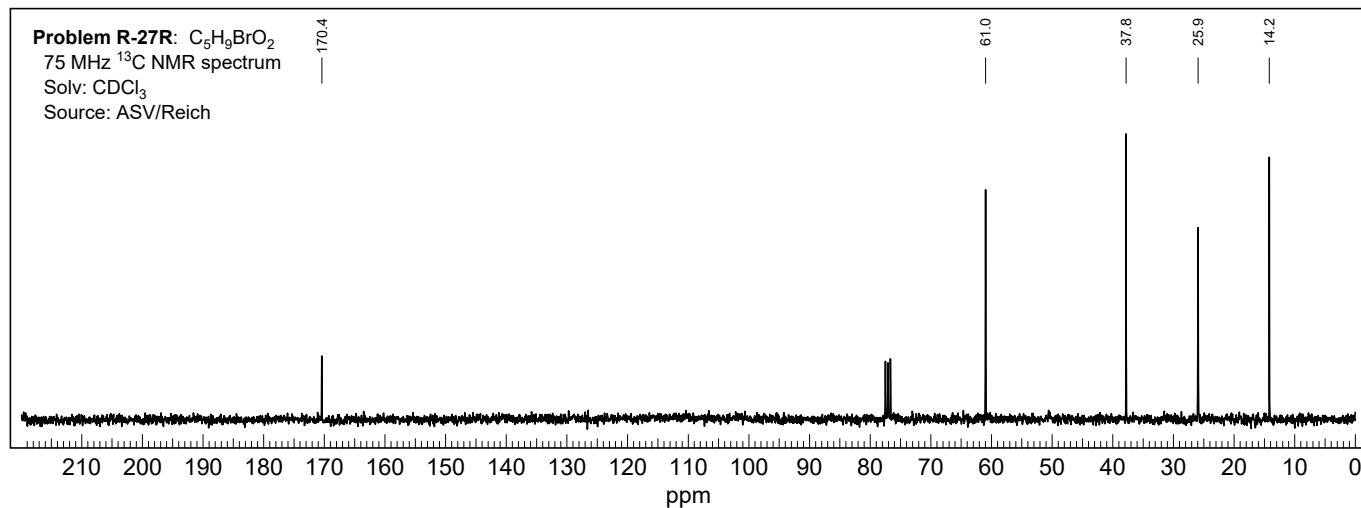
Problem R-27R: $C_5H_9BrO_2$
 300 MHz 1H NMR spectrum in $CDCl_3$
 Source: Aldrich Spectra Viewer 33-09



Infrared Spectrum:

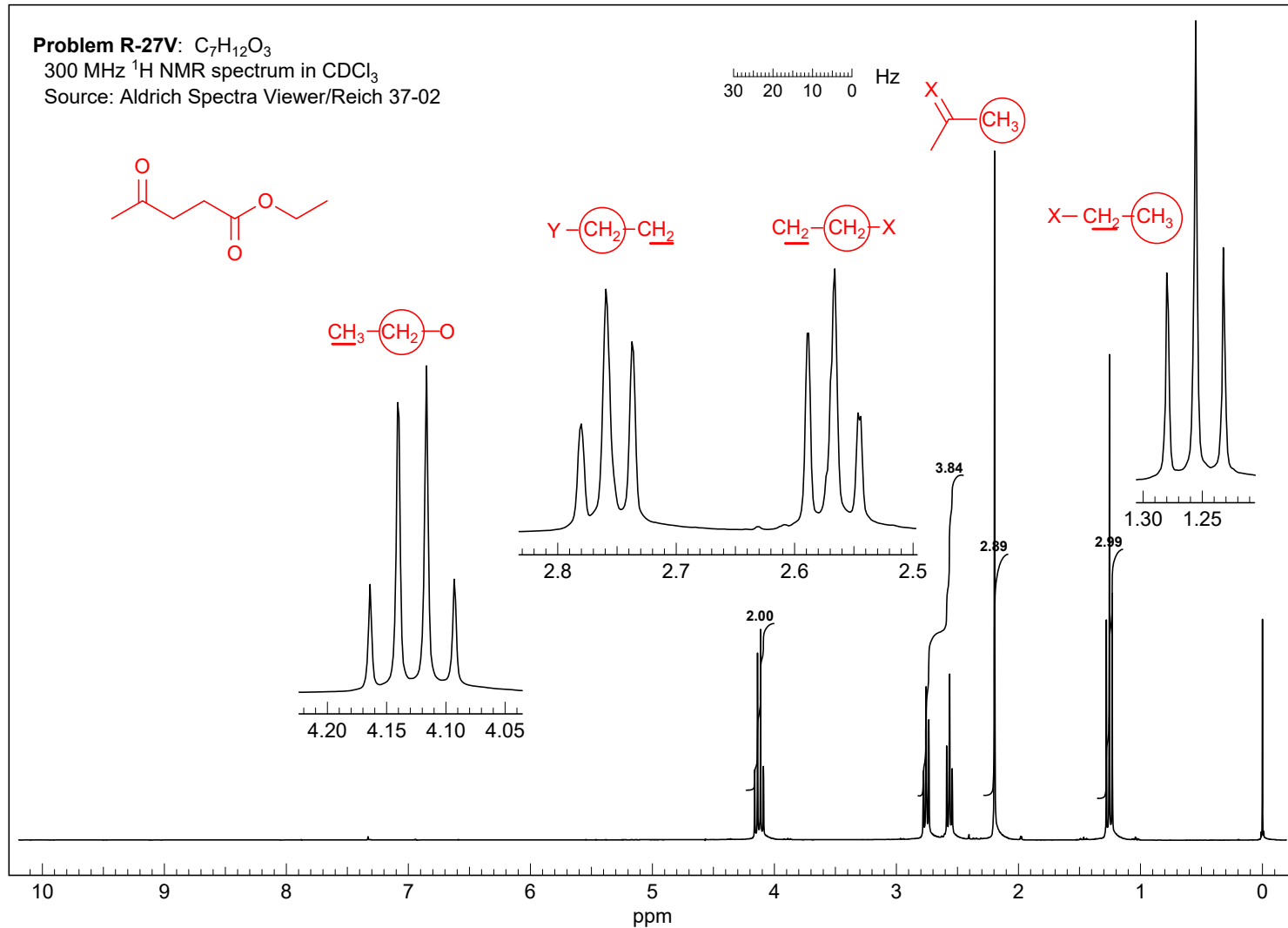


Problem R-27R: $C_5H_9BrO_2$
 75 MHz ^{13}C NMR spectrum
 Solv: $CDCl_3$
 Source: ASV/Reich



Problem R-27V: C₇H₁₂O₃300 MHz ¹H NMR spectrum in CDCl₃

Source: Aldrich Spectra Viewer/Reich 37-02

**Problem R-27V:** C₇H₁₂O₃75 MHz ¹³C NMR spectrumSolv: CDCl₃

Source: ASV/Reich

