1H-NMR 500 MHz, CDCl3

1H-NMR Expansionen

DEPT

bbd-13C
Connect the peaks with lines to highlight the coupling pattern, and label the cross-peaks in the format $3J_{\text{H-H}}$. 
HSQC
(same as HMQC discussed)
correlation via 1 bond,
H with directly attached C)

Please label the peaks in both spectra appropriately,
i.e. $J_2$, $J_{21}$, $J_{13}$, etc.

HMBC
(correlation via multiple bonds)
$^1\text{H NMR 600 MHz}$

$^{13}\text{C/DEPT NMR 150.9 MHz}$

Ethyl sorbate
Ethyl sorbate
Unusual long-range couplings are labeled. Why are these couplings observable in this COSY?

^{13}C/DEPT NMR 150.9 MHz
Note: no signals for quarternary Carbons in the HMQC or HSQC.
IR spectrum (liquid film)

mass spectrum

UV spectrum
0.214 mg/10 ml cyclohexane
0.5 cm cell

20 MHz carbon-13
NMR spectrum
CDCl₃ solution

off-resonance decoupled

proton decoupled

100 MHz proton
NMR spectrum
CDCl₃ solution

Expansion plots are on the next page
Draw a splitting diagram and analyze the spectrum by first-order methods.
Extract the coupling constants.
Name the spin system in the Pople nomenclature
Make suggestions, why all coupling constants are small (for 3 vicinal protons)
IR Spectrum (liquid film)

Mass Spectrum

No significant UV absorption above 220 nm

$C_4H_6O_2S$

$M^{+} = 118 (< 1\%)$

$^{13}$C NMR Spectrum (50.0 MHz, CDCl$_3$ solution)

proton coupled

proton decoupled

$^1$H NMR Spectrum (200 MHz, CDCl$_3$ solution)

Expansion on the next page
(a) Draw a splitting diagram and analyse this spectrum by first-order methods, \textit{i.e.} extract all relevant coupling constants ($J$ in Hz) and chemical shifts ($\delta$ in ppm) by direct measurement.

(b) Justify the use of a first-order analysis.