CH-314 Structural Analysis
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Jigsaw 1D

Introduction to Nuclear Magnetic Resonance

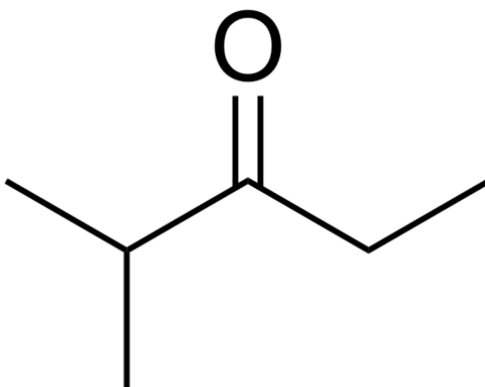1. [Keeler Section 2.2] Explain how the linewidth of an absorption mode lineshape is measured.

2. [Keeler Section 2.2] Draw schematically the signal expected from a ^{1}H doublet with a 10 Hz linewidth, for cases where the separation between the two peaks in the doublet is:

    a. 30 Hz

    b. 10 Hz

    c. 5 Hz

    d. What happens to the signal in c?

3. * [Keeler Section 2.3] The structure of 2-methyl-3-pentanone is given below.

a. Predict the ^{1}H spectrum. Show the relative intensities and the multiplicity expected from each hydrogen environment due to 3-bond couplings.

b. [Keeler Section 2.4] How many signals would the ^{13}C spectrum of the molecule have if it was recorded (i) with and (ii) without proton decoupling? *See also: Jigsaw 1D.3*

c. Why are ^{13}C spectra usually recorded with decoupling?