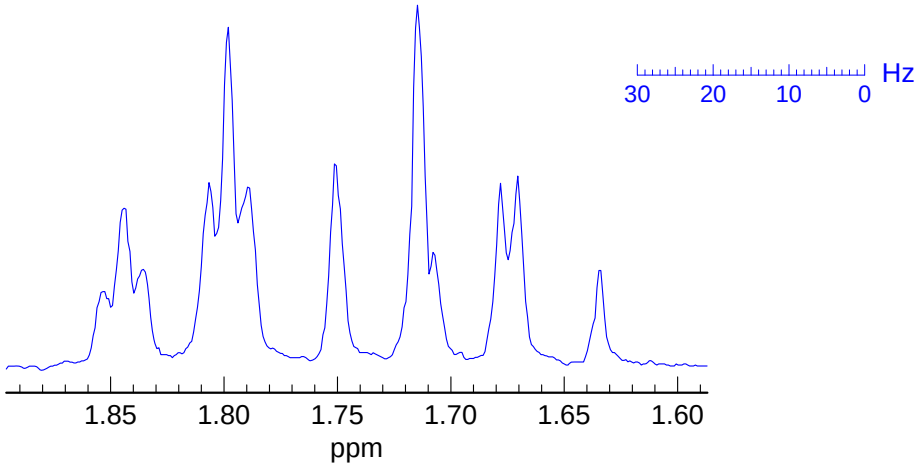
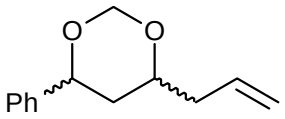
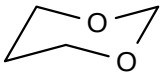
Problem R-05l ($C_{13}H_{16}O_2$). The multiplet below corresponds to two of the protons of compound **R-05l**. Analyze and assign the multiplet, report couplings and δ values, and determine the stereochemistry and conformation of the compound (add appropriate substituents and protons to the structure on the right). Briefly explain your reasoning (*Chem. Ber.* **1992**, *125*, 1471).

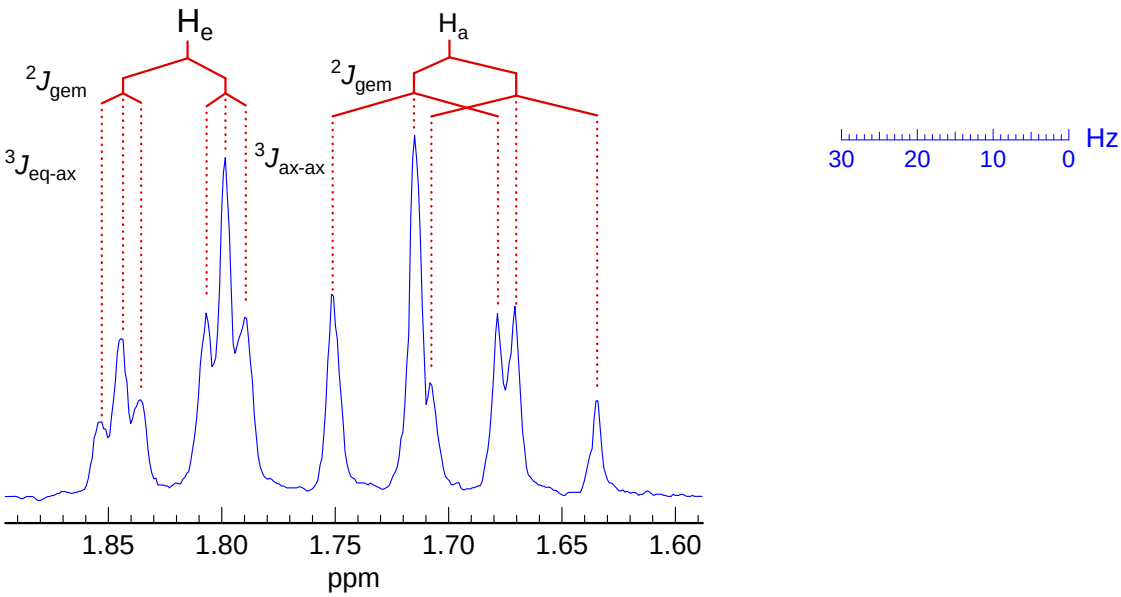


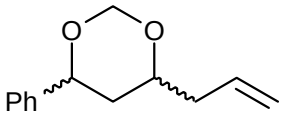


R-05l

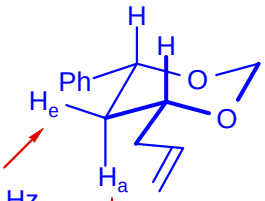


Problem R-05I (C13H16O2). The multiplet below corresponds to two of the protons of compound **R-05I**. Analyze and assign the multiplet, report couplings and δ values, and determine the stereochemistry and conformation of the compound (add appropriate substituents and protons to the structure on the right). Briefly explain your reasoning (*Chem. Ber.* **1992**, *125*, 1471).





R-05I



δ 1.82, dt, 13, 2.5 Hz
gem and two eq-ax couplings

δ 1.69, dt, 13, 11 Hz
gem and two axial-axial couplings
both substituents must be equatorial

From the chemical shift and coupling, these protons have to be the ring CH_2 protons.

3 pts each for multiplet analysis, 9 pts for answer and explanation