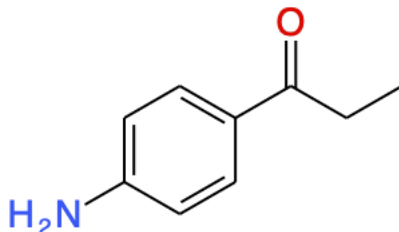


Jigsaw 4D

1. [From Past Exam] Consider the following molecule.



- a. Draw schematically the solution state ^1H spectrum of the molecule in CDCl_3 and label the peaks. Use qualitative estimates for the expected chemical shifts. Consider only $^3J_{\text{HH}}$ couplings.
- b. [Keeler Sections 8.7 and 10.6] Draw schematically the ^1H - ^{13}C HMBC and HSQC spectra on the same plot. Assume the HMBC spectrum shows connectivity through up to three bonds. Circle the peaks unique to the HMBC spectrum.
2. [From Past Exam] [Keeler Section 12.2 and Hore Section 3.3] For each compound, determine whether the protons shown in bold are magnetically and/or chemically equivalent.

