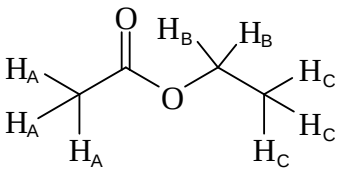
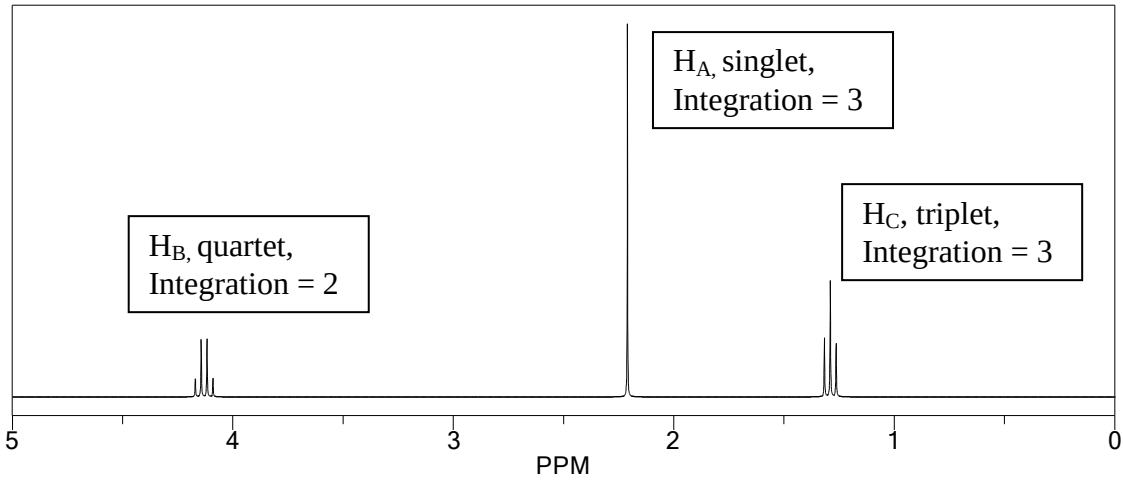
Marks 6

- Sketch the resonances you would expect to observe for protons H_B and H_C in the ^1H NMR spectrum of compound **X**. Ensure that the approximate chemical shifts, as well as peak splittings and signal integrations are incorporated in your answer. (The resonance for H_A is provided as a guide.)

X





H_B have the highest shift since they are closest to the electronegative O atoms. There are two H_B atoms so the signal has an integral of 2. The H_B atoms are coupling to 3 × H_C atoms giving rise to a (n + 1) = (3 + 1) = 4 line multiplet (a *quartet*).

H_C have the lowest shift since they are further from the electronegative O atoms. There are three H_B atoms so the signal has an integral of 3. The H_C atoms are coupling to 2 × H_B atoms giving rise to a (n + 1) = (2 + 1) = 3 line multiplet (a *triplet*).