1. For the following three IR spectra, you could have a ketone, an aldehyde, an amide, or an alcohol. Match spectrum to the functional group (you should have one left over!) (2 pts each).
2. How many unique $^1H$ NMR signals do you expect to see for the following compound (2 pts)? Predict the integration and approximate chemical shift for each signal (5 pts).

![Structural formula of the compound](image)

3. Given the following spectroscopic data, answer the questions on the next page. The elemental analysis is 78.6 % C and 8.2 % H.
a. What is the molecular formula for this compound (2 pts)? What are the units of unsaturation (2 pts)?

b. What does the IR tell you (3 pts)?

c. What does the mass spectrum tell you (3 pts)? Give relevant information about the M+ peak and the base peak.

d. Based on your interpretation of the data you have presented above, what is a possible structure for this compound (2 pts)?