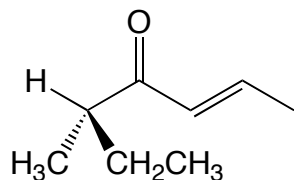
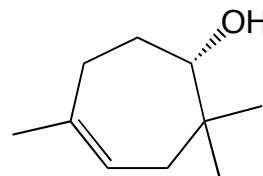


1. Both Filbertone (A) and Karahanaenol (B) are natural products responsible for the scents of the plants from which they are found. Filbertone smells of hazelnuts, while Karahanaenol smells minty. They were both named after people known to their discoverers. Provide IUPAC names for each. (10 pts)

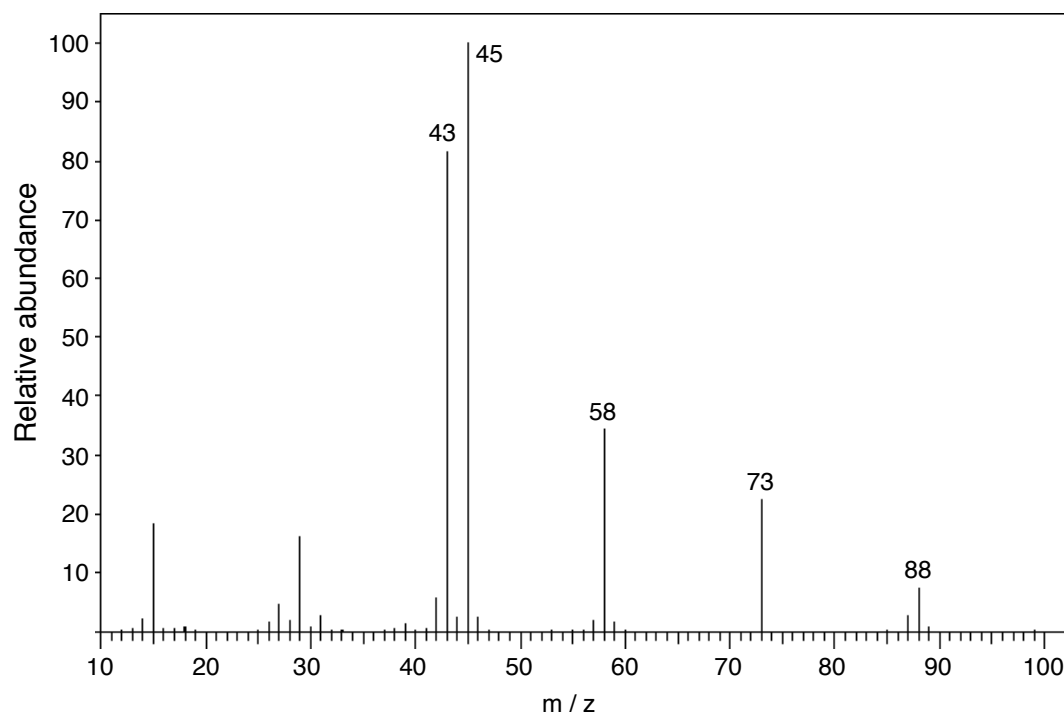
A



B

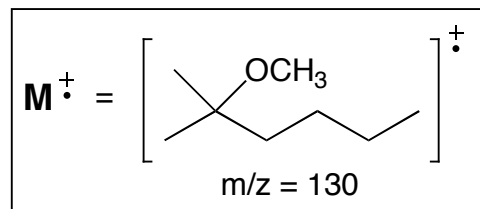


2. An unknown compound shows a UV absorption peak at $\lambda_{\text{max}} = 280 \text{ nm}$ and yields the MS below. It reacts with 1 equiv. of $\text{NaBH}_4 / \text{EtOH}$, but does not react with weak bases such as NaHCO_3 . Provide a structure for the unknown (**circle it**), as well as for each numbered peak in the spectrogram. (15 pts)



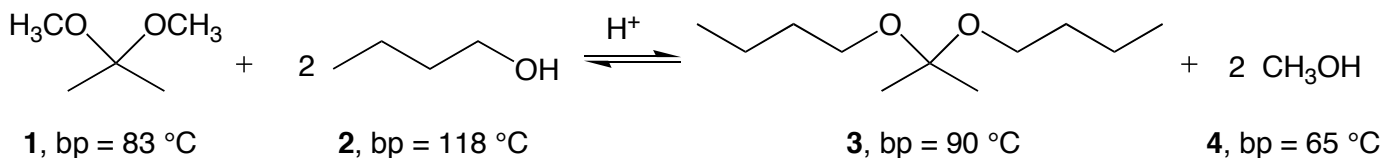
3. We have seen how certain functional groups undergo characteristic fragmentations when subjected to mass spectrometry. The ether shown in the box undergoes two curious fragmentations. One is similar to the McLafferty rearrangement that carbonyls undergo. The other is similar to the process whereby alcohols lose water, except the ether loses a stable piece that has a mass of 32. Show mechanisms for each fragmentation, along with the fragments for each process. Be mindful of your charges, nonbonded electrons, and the types of arrows you use. (12 pts)

McLafferty-like rearrangement



Alcohol-like fragmentation

4. Provide a mechanism for the reaction shown below. Be sure to show all intermediates and any formal charges in your structures. At what temperature should the reaction be run to get mostly **3**? (13 pts)



Indicate
temp. here:

5. Draw the **major product(s)** of each of the following reactions and circle it/them. Be sure to show stereochemistry where appropriate. (30 pts)

