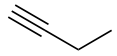
Chemistry 235
Experiment 8 – Report Sheet

Name:	Lab Room:	Desk #:

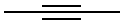
Pre-Lab Questions (Complete Prior to Lab)

1. Carbon dioxide (CO_2) has two types of bond stretches: symmetrical and unsymmetrical. Classify each one of these stretches as IR active or IR inactive and explain your choice.

2. How could you use IR spectroscopy to differentiate between the two isomers below?



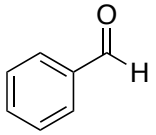
1-butyne

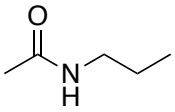


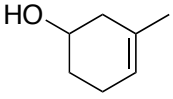
2-butyne

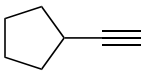
3. Which bond is stronger: the C=O of an ester (1735 cm^{-1}) or the C=O bond of a ketone (1715 cm^{-1}). Explain your answer based on the IR stretches.

4. For each compound below, approximate two or three of the most important IR absorptions that you would expect to see.









5. For each group of IR frequencies listed below, suggest the functional group that is present.
   a) 1734, 1250, 1080 cm^{-1}

   b) 3400 (broad), 1050 cm^{-1}

   c) 3050, 1650 cm^{-1}

Experimental Data (Complete During Lab)

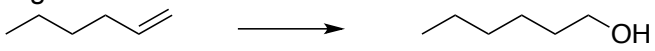
For each unknown, record the IR spectrum then go through the IR and pick out key absorptions. List these absorptions in the table below along with the structural/functional group assignment for each absorption. Using this data and the supplemental tables of possible IR unknowns, narrow down your unknown to three (or fewer) potential compounds.

Unknown Number:	
Key IR Absorptions	**Assignment**
Possible Identification (up to three structures)	

Unknown Number:	
Key IR Absorptions	**Assignment**
Possible Identification (up to three structures)	

Post-Lab Questions (Complete Following Lab)

1. Explain how IR spectroscopy could be used to monitor the hydroboration-oxidation reaction of 1-hexene to give 1-hexanol.



2. When cleaning the IR crystal between analyses, why is important to ensure that your cleaning solvent has completely evaporated prior to running the next sample?