4.3: Gas Chromatography Report Sheets

Name (first and last):

Lab Partner (first and last):

Date of experiment:

Observations **(2 points)**

Write all observations below while performing the experiment as you work through each step. This will be your basis for answering questions and for validating your conclusion statement. You will refer to these observations for the answers to the questions and for the conclusion.

Data Tables (3 points)

Table 4.3.1. Boiling Points and Retentions Times for individual ketones.

Compounds	Boiling Point (°C)	Retention Time (min)
acetone		
2-butanone		
cyclohexanone		

Table 4.3.2. Retention Times for the 3 Peaks in the known mixture.

Elution Order	Compound	Retention Time (min)
1		
2		
3		

Analysis of the Unknown Mixture (2 points)

Record the retention times of the peaks present in the unknown.

Identify the compounds that relate to the retention time.

> **Note**
>
> Staple the chromatograms for your group to the lab report of one team member or upload these to the D2L assignment box and note this in each group members report sheets.

Table 4.3.3. Retention Times for the peaks in the unknown mixture. All spaces may not be filled in.

Elution order	Retention Time (min)	Proposed Compound
1		
2		
3		

Post Lab data analysis and questions

(2 point each unless noted)

1. Draw 2 molecules of acetone and show with labels all of the intermolecular forces that are present in a sample of pure acetone? (1 point)

2. Based on what you learned about intermolecular forces in CH105, explain the trend in ketone boiling points you reported in the pre-lab exercise.

3. In the Pre-Lab table, you predicted the elution order of some of the ketones. Did the elution times of the ketones support your prediction? Explain why or why not use your data to support your answer.

4. 2-hexanone and 4-methyl-2-pentanone are isomers, thus their molecular weights are equal. Suggest reasons for their differing boiling points. Predict their relative GC retention times. (hint: draw each structure)

5. Draw the structure of diethyl ketone (3-pentanone) below. Based on the results of your testing, predict the retention time of diethyl ketone. Explain your prediction.

6. If you ran the GC at higher temperatures, how would this change the retention time of the ketones you examined in this lab? Why?

7. Draw the structure of isopropyl alcohol (2-propanol) below. Assuming that the stationary phase in the column can act as both a hydrogen bond donor and a hydrogen bond acceptor, how would you expect the retention time of isopropyl alcohol to compare to that of acetone? Why?