Name _____ Partner Name _____

TA Name _____ Section Day _____ Time _____

Experiment 2.1 Worksheet

Use as reference for notebook preparation – every student submits on Canvas individually after lab

Pre-Lab Requirements

1. **Dress for lab** – see safety rules – arrive a few minutes early
2. **Lab Notebook:** copy templates below into designated notebook
   - **Purpose, scheme,** and **reagent table**
   - **Procedure Diagrams** – must be complete before you can start the lab

A. Purpose, sketch of citrus, and structures of terpenes:

B. Reagent Table

Sample Name	**Amount** Fill in during lab	**Molecular Mass**	**mmoles** Fill in during lab	**Boiling or melting point**	**Density**	**Hazards**
Citrus Peels		n/a	n/a	n/a	n/a	Enter terpene hazards:
Water						

C. Procedure – diagrams of key procedural segments on as many pages as needed.

- Include all **labeled equipment, chemical names** with **amounts**, and pertinent **safety notes**.
- Leave space to record additional notes and observations within the procedure diagrams

Step 1. Preparation of peels from home

Step 2. Distillation Apparatus – copy **Figure 2** from Exp 2 PDF

- Diagram of complete distillation setup with labeled components and contents in flask
- Not necessary to show order of assembly 😊

Step 3. Separation and Collection of Citrus Oil

- Buret setup – addition of water and distillate

E. Data

Description of your peels & those of a neighboring pair (size, color, fragrance, texture, etc.):

Mass of citrus peels _____ g

Volume of water _____ mL

Distillation temperature: first drop _____ C final temperature _____ C

Mass of citrus oil _____ g Percent Recovery _____%

Calculation: % Recovery = (mass citrus oil) / (mass of peels) x 100%

F. Practice Calculations

GC chromatograms are on Canvas & in the lab for practice measuring retention times and integration.

- Show one sample calculation each for retention time, integration, and percent composition.
- Report your findings in the tables and show sample calculation below.

Table 1. Standard GC Retention times

Sample	**Corrected t_R (s)**
α-pinene standard	
β-pinene std.	
Limonene std.	
γ-terpinene std.	
Carvone std.*	
Citrals std.*	

* Carvone and citrals standards will not be injected in Exp 2.

Table 3. GC Analysis of Unknown Oil #4 – *do this simpler one first*

Peak #	**Peak ID****	**Corrected t_R (s)**	**Integration (cm^2)**	**% Composition**
1				
2				

Table 2. GC Analysis of Citrus Oil (Unknown Oil #1)

** Use corrected retention times to assign each peak to one of the standards.
Note that not all standards may be present, some peaks overlap, and other unknown peaks may appear.

Peak #	**Peak ID****	**Corrected t_R (s)**	**Integration (cm^2)**	**% Composition**
1				
2				
3				
4				
5				
6				