Limonene Lab Report

NAME:_____

PARTNER'S NAME:_____

LAB SECTION:_____

DATE:_____

% SCORE:

Prelab quiz	10	
A.Lab data		
B. Spectroscopy Unknown terpene & limonene IR		
C. Questions		
D. Essay: Discuss & Interpret your results		
Total		

ABSTRACT: Practice writing an abstract for the isolation of limonene from orange peel an abstract will be required for the remaining 4 labs. For information on writing an abstract see the Appendix.

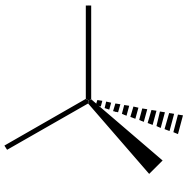
B. IR SPECTRA OF TERPENES.

1. Using the IR spectrum you obtained for the unknown terpene, determine the identity as one of the structures in Figure 4. On the spectrum label the bonding features (e.g. sp2 C-H, C=O) on the IR that would best explain your choice. Attach the spectrum of the unknown labeled with your name, compound name and identified features.

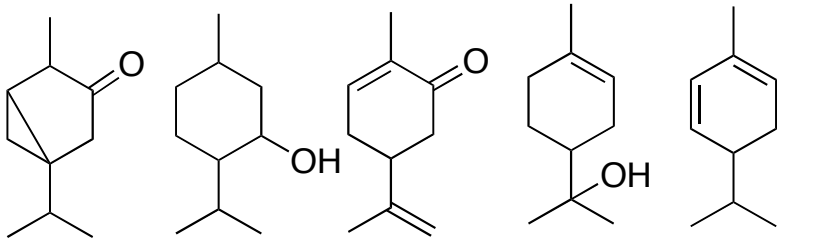
2. Assign the peaks corresponding to the sp2 C-H and C=C bond stretch on your IR of limonene and attach this IR to your report labeled with your name and sample name.

C. QUESTIONS:

1. Refer to a reference text and using your measured optical rotation, determine the predominant configuration of limonene found in orange peels, R or S. Draw a 3D representation of limonene in the configuration by completing the stereocenter below.

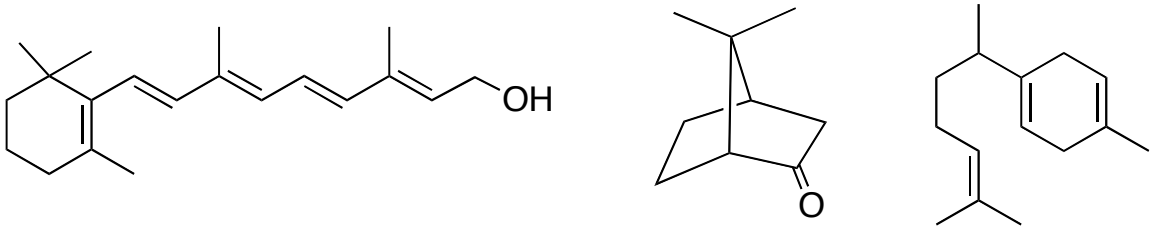


2. Mark the chiral centers in each cyclic monoterpene below with an asterisk.



α–Thujone (absinthe) | Menthol (peppermint) | Carvone (caraway) | Terpineol (pine oil) | α-Phellandrene (eucalytus)

3. Two of the compounds below are naturally occurring terpenes. Determine which compounds are terpenes, then circle the isoprene units in those compounds. Recall that isoprene units connect head to tail.

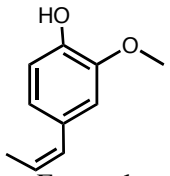


D. Discussion

All distillations use boiling point differences to separate volatile liquids from mixtures. What are the differences between steam distillation and distillation of miscible compounds (fractional and simple) in terms of distilling temperature and composition of the distillate during distillation?

Which type of distillation (steam, fractional, simple) would you use to separate the compounds below? Briefly explain your choices

1. Eugenol and ground cloves



Eugenol

2. A reaction mixture of starting material alcohol (Bp 160°C) and product alkene (Bp 106)

3. A product mixture of 1,1-dichlorobutane (Bp 112), 1,2-dichlorobutane (Bp 122), and 1,3-dichlorobutane (Bp 132),