

Laboratory Report

Properties of Alcohols	Ethanol	2-Propanol	2-Methyl-2-propanol	Cyclohexanol
Water Solubility				
Reaction with K_2CrO_4				

Qualitative Color Tests	Ethanol	2-Propanol	Salicylic acid
Cerium(IV) Ammonium Nitrate			
Iron(III) Chloride			

Qualitative Tests for Aldehydes	Acetaldehyde	Benzaldehyde	Acetone
Tollens' Reagent			
Schiff's Reagent			

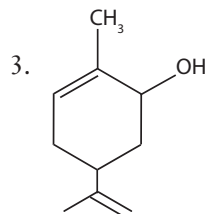
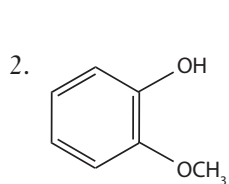
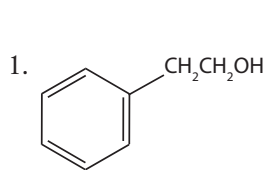
Natural Product Testing	Cinnamon Oil	Eugenol	Geraniol
Iron(III) Chloride			
Schiff's Reagent			
Potassium Chromate			

1. Compare the solubility of ethanol, 2-propanol, 2-methyl-2-propanol, and cyclohexanol in water. Explain any differences and write a general statement describing the solubility of alcohols in water.

2. Which alcohol did not react with potassium chromate? Explain why, based on its structure.

3. Draw the structures of cyclohexanol and its likely oxidation product. Circle or label the hydrogen atoms that are "lost" when cyclohexanol is oxidized.

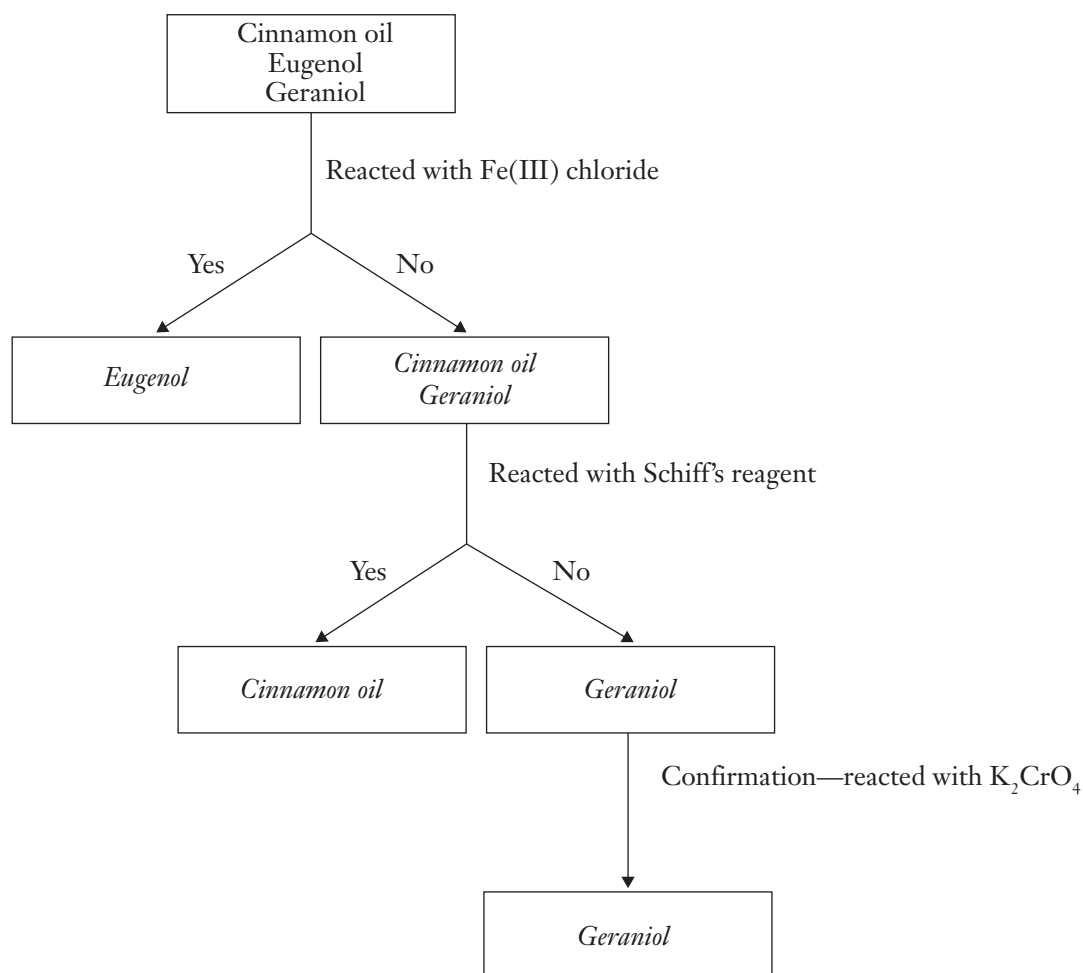
4. Consider the structures of compounds 1–3 shown below. Which compounds would be expected to react with (a) cerium(IV) nitrate and (b) iron(III) chloride, respectively? Explain.



5. (a) Write a chemical equation for and draw the structure of the product obtained when benzaldehyde reacts with Tollens' reagent. (b) Identify the functional group in the product and explain how you can determine, based on its molecular formula, that this product results from oxidation of benzaldehyde.
6. Compare the boiling point data for ethanol, its isomer, dimethyl ether, and two other compounds having similar molar masses. Explain the trend based on the types and strength of intermolecular forces.

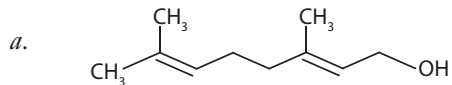
	$\text{CH}_3\text{CH}_2\text{CH}_3$	CH_3Cl	$\text{CH}_3\text{—O—CH}_3$	$\text{CH}_3\text{CH}_2\text{OH}$
Molar mass (g/mole)	44	50	46	46
Boiling point (°C)	-42	-24	-25	78

7. Complete the following flow chart for the qualitative analysis of the natural products tested in this lab. Fill in the boxes with the name(s) of the compounds that gave positive and negative results, respectively, with the indicated reagents.

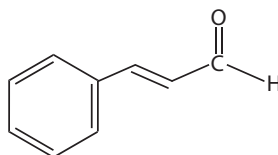


8. Match each natural product with its structure (a–c) based on the flow chart analysis completed above.

Cinnamon oil _____ Eugenol _____ Geraniol _____



b.



c.

