

Name: _____
Locker Number: _____

CHEMISTRY 354-355

Experiment 57

ESSENTIAL OILS FROM SPICES

1. Identify the spice that you used, and draw the structure of essential oil that you isolated.
2. Report the **grams** of essential oil that you isolated after the final purification step.
3. Report the **weight percent recovery**. Show your calculation.
4. Attach the infrared spectrum of your sample of essential oil to this report. Provide an interpretation of the important infrared bands (write directly on the spectrum).
5. What are your **conclusions** about this experiment?
6. Answer each of the following questions.

- a) Why are the essential oils steam-distilled rather than purified by simple distillation?
- b) A natural product (MW = 150) distills with steam at a boiling temperature of 99°C at atmospheric pressure. The vapor pressure of water at 99° is 733 mmHg.
- i) Calculate the weight of the natural product that co-distills with each gram of water at 99°C.
- ii) How much water must be removed by steam distillation to recover this natural product from 0.5 g of a spice that contains 10% of the desired substance?
7. If you have any essential oil left over after the infrared spectroscopy, you may submit it in a properly labeled sample vial.