Chemistry 260 Summer 2025

E5 Isolation of a Natural Product

**<<Complete this report form by inputting the information indicated by red text. Delete red text instructions before submitting (there are marks associated with doing so.>>**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section: \_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Abstract (1 mark)**

<<Delete this text and insert an abstract with a line drawing of the compound(s) isolated.>>

**Reagents and Products Tables (0.5 marks each)** <<You only need to fill in a few blanks here.>>

Table 1. Reagents for the reaction

| Compound | MW (g/mol) | Used | mmol | Physical and Safety Data |
| --- | --- | --- | --- | --- |
| caraway oil | - | 2 grams | - | irritant |
| spearmint oil | - | 2 grams | - | irritant |
| ethyl acetate | 88.11 | solvent | N/A | Flammable, irritant. Bp 76.5-77.5oC; density 0.902 g/mL |
| hexanes | 86.18 | solvent | N/A | Flammable; hghly toxic; density 0.672 g.mL-1; bp 68-70oC |

Table 2. Product of the reaction

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Compound | Physical Description | MW (g/mol) | Amount Isolated | mmol | % recovery |
|  |  |  |  |  |  |

**Procedure and Observations (0.5 marks each)**

**Procedure:** <<Delete and insert a reference to the procedure>>

**Observations:** <<Delete this text and insert any observations you made during the experiment.>

**Results**

**Percent Recovery Calculation: (1 mark)**

<<Delete this text and insert a % recovery (from the mass of oil) calculation>>

**TLC Analysis: (1 mark)**

<<IMAGE>><<Delete this text and insert images of your TLC plate(s)>>

**Table 3.** Summary of TLC results from column chromatography.

<<Add or remove/merge rows to suit your data. Shading is included to try to help divide data.>>

|  |  |  |  |
| --- | --- | --- | --- |
| Fraction | Number of spots | Rf | Identity of compound |
| **1** |  |  |  |
|  |  |
| **2** |  |  |  |
|  |  |
| **3** |  |  |  |
|  |  |
| **4** |  |  |  |
|  |  |
| **5** |  |  |  |
|  |  |
| **6** |  |  |  |
|  |  |
| **7** |  |  |  |
|  |  |
| **8** |  |  |  |
|  |  |
| **9** |  |  |  |
|  |  |
| **10** |  |  |  |
|  |  |
| **11** |  |  |  |
|  |  |
| **12** |  |  |  |
|  |  |

Polarimetry Data: (1 mark)

**Table 4.** Summary of polarimetry results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Oil separated | Mass of sample | Volume of solvent | Measured rotation,  | Specific rotation, [ |
| Caraway oil |  |  |  |  |
| Spearmint oil |  |  |  |  |

**Sample calculation of specific rotation:**

<<Delete this text and insert a calculation>>

1H NMR Data: (1 mark)

|  |  |  |  |
| --- | --- | --- | --- |
| Alkene signal | (ppm) | Relative Integration | % composition |
| carvone |  |  |  |
| limonene |  |  |  |

**Sample calculation of % composition:**

<<Delete this text and insert a calculation>>

**Discussion (9 marks; maximum 500 words)**

<< Delete this text and insert your discussion. Discuss the success/failure of the experiment, and provide analysis of the yield and purity. The discussion should include comments on potential improvements of the experiment. Was your isolated sample pure, according to your data? What other analysis techniques could we have used in this experiment? Which enantiomer of carvone is present in which oil, and how do you know?>>

**References** <<Insert references>>

**Appendices** <<Attach your numbered appendices with titles.>>

**Additional Graded Components:**

**Prelab: 2 marks**

**Samples & Clean-up: 1 marks**

**Appropriate editing and formatting of the report: 1 marks**