Chemistry 260 Summer 2024

E5 Separation of a Reaction Mixture

**<<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: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Reaction Scheme (1 mark)**

<<Delete this text and insert a reaction scheme.>>

**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 |
| --- | --- | --- | --- | --- |
| chloranil | 245.88 |  |  | Irritant. Mp 295-296oC |
| ammonium hydroxide (28%) | 35.04 | ~1 mL | ~15 | Lachrymator; corrosive. 14.5 M is 28.0% by weight in water; density is 0.9 g/mL |
| 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 | % yield |
| 2,5-diamino-3,6-dichloro-1,4-benzoquinone |  | 207.01 |  |  |  |

**Procedure and Observations (2 marks)**

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

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

**Results**

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

<<Delete this text and insert a % yield calculation>>

**TLC Analysis: (5 marks)**

<<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** |  |  |  |
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| **5** |  |  |  |
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| **6** |  |  |  |
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| **8** |  |  |  |
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| **9** |  |  |  |
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| **10** |  |  |  |
|  |  |
| **11** |  |  |  |
|  |  |
| **12** |  |  |  |
|  |  |

IR Data: (2 marks)

Table 5. **KEY** signals in the IR of 2,5-diamino-3,6-dichloro-1,4-benzoquinone (only list key peaks used for identification)

|  |  |  |
| --- | --- | --- |
| Wavenumber (cm-1) | Strength (s/m/w) | Assignment and/or Comment |
|  |  |  |
|  |  |  |
|  |  |  |

The IR spectrum is attached to this report as Appendix <<X>>.

**Discussion (15 marks; maximum 400 words)**

<< Delete this text and insert your discussion. Explain the chemical significance of your results, and do not assume that the reader already knows the answers! Explain it as if you are trying to convince someone who has not seen this data before.

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.>>

**References (1 mark)** <<Insert references>>

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

**Additional Graded Components:**

**Prelab: 4 marks**

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

**Appropriate editing and formatting of the report: 2 marks**