Chemistry 260 Fall 2025

E13 Electrophilic Addition - Bromination of Stilbene

**<<This report will be completed as an “in-lab assignment” that you will work on and hand in at the end of the period. You can do a lot of the work in advance!>>**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Section:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Observations (1 mark)**

**Reagents and Products Tables (1 mark each)**

Table 1. Reagents for the bromination reaction

| Compound | MW (g/mol) | Used | mmol | Physical and Safety Data |
| --- | --- | --- | --- | --- |
| *Trans*-stilbene | 180.25 |  |  | Irritant. Mp 123-125oC |
| Pyridinium tribromide | 319.82 |  |  | Corrosive, respiratory irritant. Releases bromine, treat with caution! |
| ethanol | 46.08 | ~25 mL | N/A | Flammable liquid; irritant. Bp 78 oC; density 0.789 g/mL. |
| methanol | 32.04 | ~10 mL | N/A | Flammable liquid; toxic. Bp 64.7 oC; density 0.791 g/mL. |

Table 2. Product of the bromination reaction

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Compound | Physical Description | MW (g/mol) | Amount Isolated | mmol | % yield |
| 1,2-dibromo-1,2-diphenylethane |  | 340.05 |  |  |  |

**Results**

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

**Melting Range: (2 marks)**

Table 3. Melting range analysis of the product

|  |  |
| --- | --- |
| Melting Range | Inferred Identity of Compound |
|  |  |

**In-lab Assignment Questions:**

Pre-lab:

1. Draw structures, including wedges & dashes to indicate stereochemistry, of the outcomes of (a) *syn* addition; and (b) *anti* addition of bromine to *trans*-stilbene. Make sure you clearly label which are the *syn* versus *anti* products. (**3 marks**)
2. Now draw the *syn* and *anti* products above as Newman projections, and provide the name of each compound (including R, S, meso designations. Use this information to fill out the table below and predict the melting range of the product(s) of both a *syn* and *anti* addition using the literature values beneath the table. (**3 marks**)

Table 4. Melting range analysis of the two products

|  |  |  |
| --- | --- | --- |
| Type of Addition | Name(s) of products(s) | Predicted melting range |
| ***syn*** |  |  |
| ***anti*** |  |  |

Literature melting points:

*meso*-1,2-dibromo-1,2-diphenylethane: 237 °C

(1R, 2R)-1,2-dibromo-1,2-diphenylethane: 241 °C

(1S, 2S)-1,2-dibromo-1,2-diphenylethane: 239 °C

**During lab:**

1. What does the meting range recorded for your product tell you about the nature of the addition reaction that took place? Explain (feel free to refer to the answers to the first two questions above). (**3 marks**)