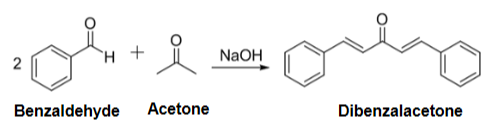
**CH 246: ORGANIC CHEMISTRY II LABORATORY (Spring 2021)**

**Title:** Aldol Reaction

1. **Purpose: (1 point)**

**The purpose of this reaction is to demonstrate the aldol condensation reaction by preparing dibenzalacetone from acetone and benzaldehyde.**

1. **Drawing of structure of the main compound or balanced chemical equation if synthesis is performed: (1 point)**



**3. Reagents and the major product (up to 5 points)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **M.W.**  (0.5 pts) | **Density**  (0.5 pts) | **Amount (grams/mL)**  (0.5 pts) | **Moles**  (0.5 pts) | **Hazards/Precautions**  **(MSDS data) and melting point or boiling point** (2 pts) | **Role of the reagent** (1 pts)\* |
| Benzaldehyde | 106.041 | 1.0415 g/cm3 | 0.8 mL | 0.008 | Combustible liquid and vapor. Causes digestive and respiratory tract irritation. Causes eye and skin irritation.  MP: -56°C  BP: 178°C | Reactant |
| Acetone | 58.08 | 0.788 g/cm3 | 0.3 mL | 0.004 | Extremely flammable liquid and vapor. Causes eye irritation. Aspiration hazard if swallowed.  MP: -94°C  BP: 56.5°C | Reactant |
| Sodium Hydroxide | 40 | 2.13 g/cm3 | 0.4 g | 0.001 | Causes eye and skin burns. Causes digestive and respiratory tract burns.  MP: 318°C  BP: 1390°C | Catalyst |
| Ethanol | 46.0414 | 0.790 g/cm3 | 2 mL 95% solution + washes | -- | Flammable liquid and vapor. Causes severe eye irritation. Causes respiratory tract irritation. Causes moderate skin irritation.  MP: -114.1°C  BP: 78°C | Solvent |
| Ethyl acetate | 88.11 | 0.9 g/cm3 | 2.5 g solvent per gram of product | -- | Flammable liquid and vapor. Causes eye irritation. May cause respiratory tract irritation.  MP: -83°C  BP: 77°C | Solvent |
| Dibenzalacetone | 234.30 | 1.1 g/cm3 | -- | -- | May cause eye, skin, and respiratory tract irritation.  MP: 107-114°C | Product |

**\*** Mention role as either reactant, solvent, catalyst or product

**4. Calculations: (1 point)**

Show each calculation for moles of reagents and for theoretical and actual yield. Fill in the box with the limiting reagent and theoretical yield:

Benzaldehyde

The limiting reagent is

0.920 g

The theoretical yield is

**5. Procedure (up to 2 points)**

|  |  |
| --- | --- |
| **Procedure** | **Observations and Lab Data** |
| A summary of the procedure done with bullet points) | Color changes, exothermic or endothermic reactions, gas generation, etc.; tare weights for flasks, etc. |
| * In a 50 mL Erlenmeyer flask prepare solution of 0.4 g of sodium hydroxide in 2 mL of water and 2 mL of 95% ethanol. * After the solution has cooled, add 0.3 mL of acetone and 0.8 mL benzaldehyde. * A yellow turbidity will appear almost immediately, which quickly turns into a flocculent precipitate. * Swirl flask from time to time and stir over a 15 minute period. * Collect mushy reaction product on a buchner funnel and wash it first with water and then chilled 95% ethanol. * Dry product. * Recrystallize product from ethyl acetate using about 2.5 g of the solvent per gram of product. * Determine melting point of product to confirm identity. |  |

**6.** Results; include actual yield in grams and % yield.

**Results (need to get signed by instructor or TA):**