Multi-Step Synthesis of Benzilic Acid

Required Components:

Title - Keep it simple

Byline

Abstract

- % yield for each step
- Melting point for each product
- % yield for overall three steps
- statement that FTIR analysis was conducted (don't put the data here)

Introduction

- Importance of carbon-carbon bond forming reactions
- Condensation of benzaldehyde utilizing Thiamine
- Don't dwell on Thiamine, it's biological importance is secondary to the synthesis
- Non-technical overview including the three main reactions carried out

Experimental

- Standard acknowledgements of chemicals and equipment used
- Any modifications to the procedures
- Characterization of each product following that products specific procedure. Characterization should be in the following format:

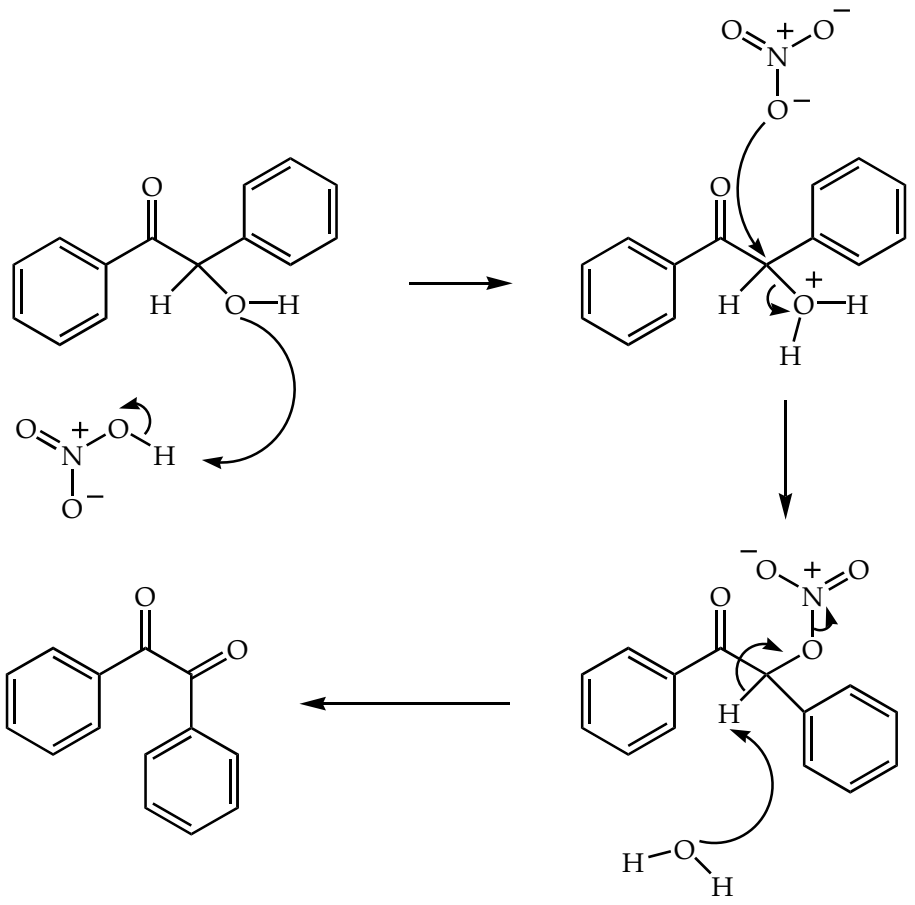
  Yield: xx.xg, xx.x mmol (xx.x%), mp. xx.x – xx.x ^{o}C. FTIR (KBr pellet, cm^{-1}): xxxx, xxxx, xxxx, …

Results

- Two tables
  - 1st - Product | Yield (g) | Yield (%) | M.p. (^{o}C)
  - 2nd - Product | Characterization (C=O, -OH etc) | cm^{-1}
- State the results in paragraph format

Discussion

- Discuss mechanisms for each of the three reactions. Mechanisms are schemes and can be hand drawn. No mechanism was provided for the oxidation step so here it is:



- Also any experimental issues you may have had while conducting the experiment should be addressed here.
- Characterization of the products by FTIR should be discussed for each product in terms of what functional groups are present and which are **not** present inferring that a transformation has occurred.

Conclusion

- Restatement of the abstract drawing on evidence presented in the discussion to draw strong conclusions regarding your results.

References
FTIR for each product
Separation scheme for each product
Copies of the laboratory notebook pages