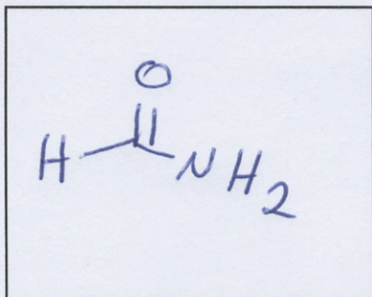
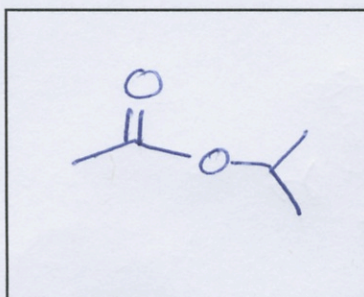


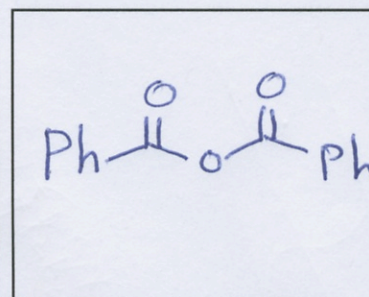
1. (6 Points, 1 point each) Give the structure for the following compounds:



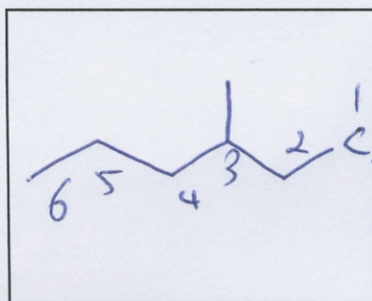
Formamide



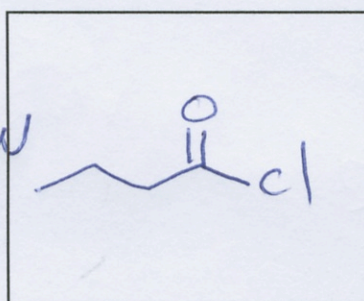
Isopropyl acetate



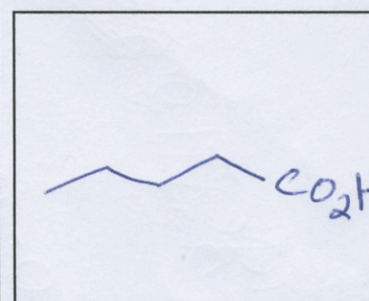
Benzoic anhydride



3-methylhexanenitrile

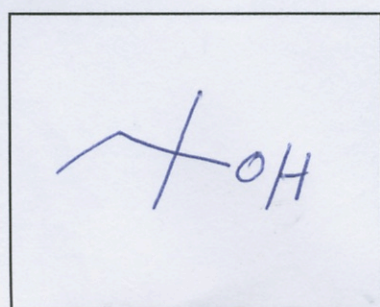


Butanoyl chloride



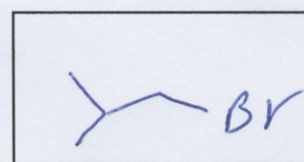
Valeric acid

2. (4 Points, 2 points each box) Complete the following Williamson ether synthesis.

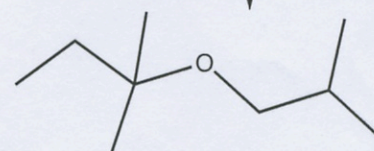


An alcohol

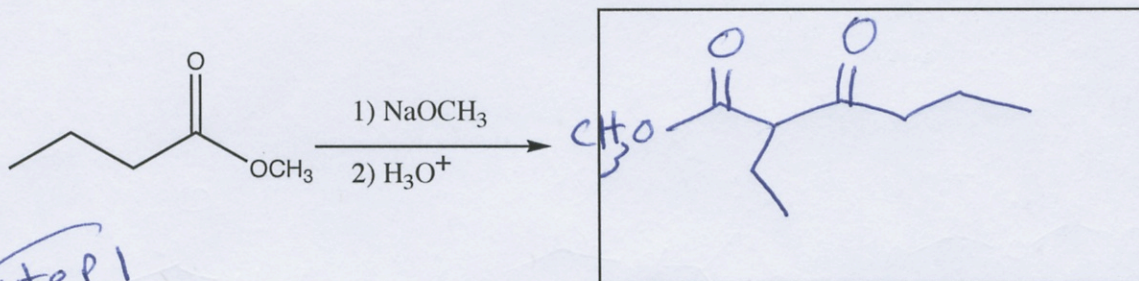
NaH → Alkoxide ion



An alkyl halide

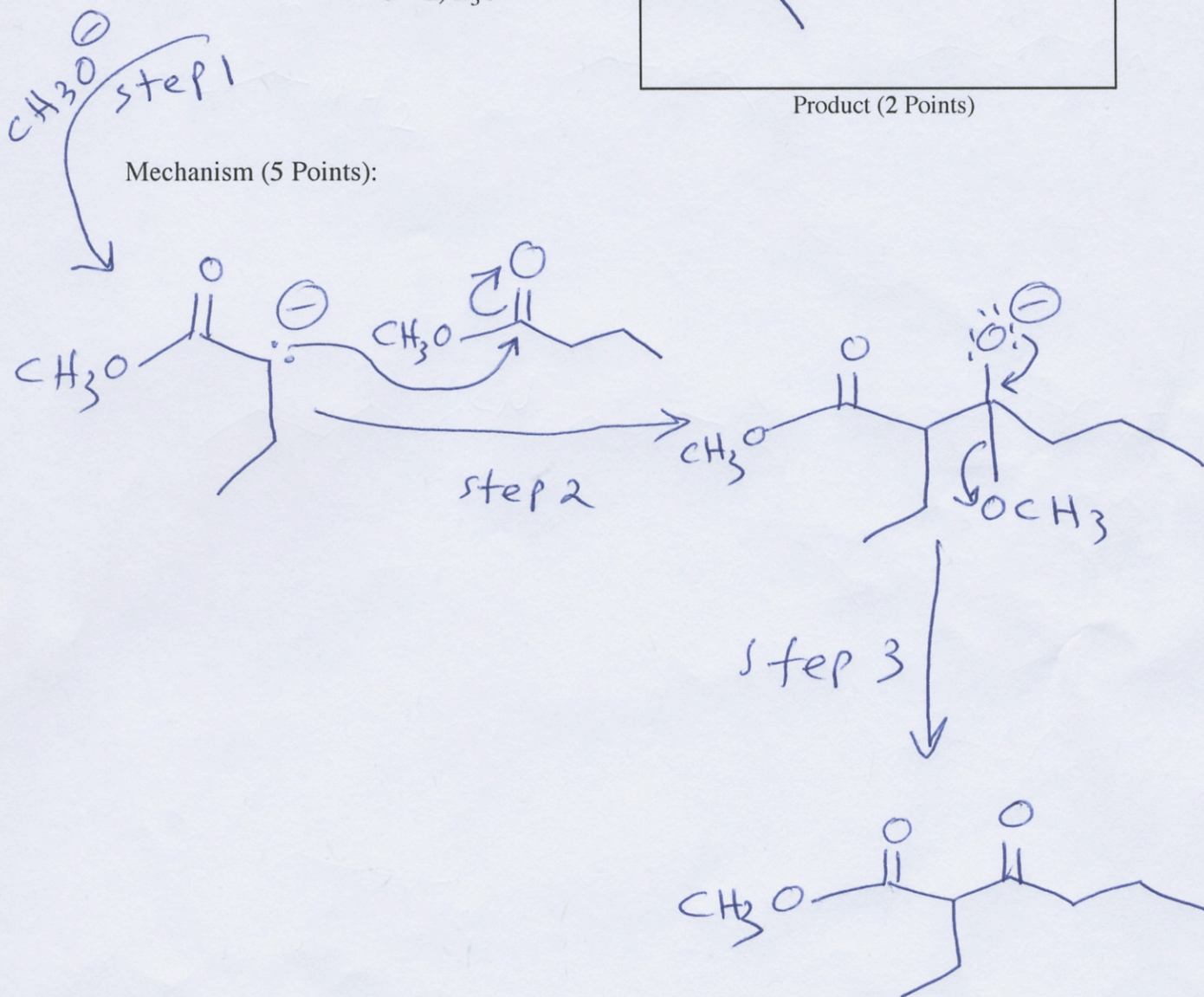


3. (7 Points) Provide a stepwise mechanism for the following Claisen condensation reaction.



Product (2 Points)

Mechanism (5 Points):



4. (8 Points, 2 points each) Complete the following reactions.

