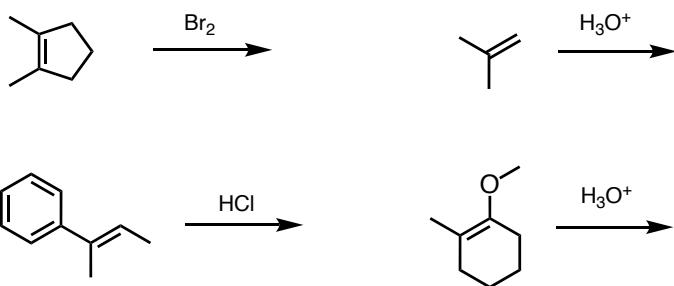


Organic Chemistry - Exercise 7

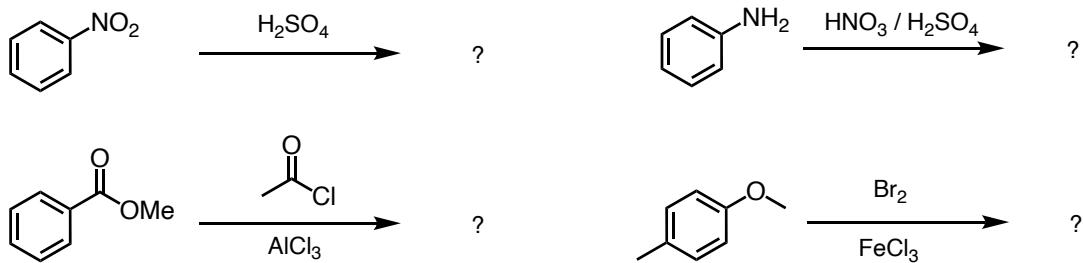
Distribution: November 11, 2024
Help: November 14, 2024
Return until: November 25, 2024

Correction made on 13.11: Question 3 has been slightly modified. The compound is 1-bromo-3,5-dinitrobenzene and not 1-bromo-2,4-dinitrobenzene.

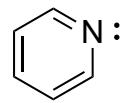
1. Draw the main product(s) of the following electrophilic additions, including all stereoisomers, but without drawing identical molecules. Give the isomeric relationship if multiple products are formed.



2. Draw the main product(s) of the following electrophilic aromatic substitution reactions and support your results on the basis of relevant resonance structures.



3. Devise a synthetic pathway to obtain 1-bromo-3,5-dinitrobenzene starting from benzene. Include the reagents and order of reactions to achieve the correct substitution pattern.
4. Similarly to benzene, pyridine can undergo electrophilic aromatic substitutions reactions.



pyridine

- a. Draw the **three relevant** zwitterionic resonance structures of pyridine.
- b. With this in mind, how does the overall reactivity of pyridine compare to benzene relative to electrophilic aromatic substitutions?
- c. Pyridine reacts with $\text{HNO}_3/\text{H}_2\text{SO}_4$ in an electrophilic aromatic substitution. Draw the product resulting from the nitration and explain the regioselectivity using your answer from question a.