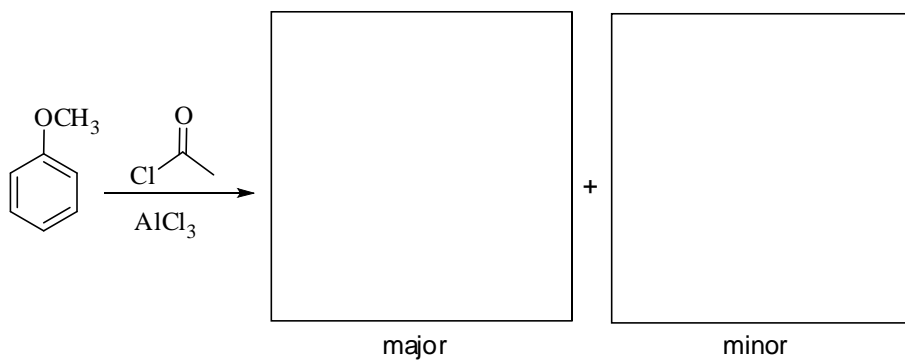


1. Provide the necessary information, product(s), reagents or starting materials, to complete the following reactions. (3 pts. per question)

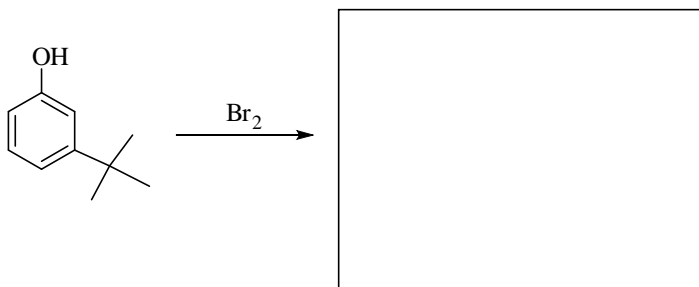
a)



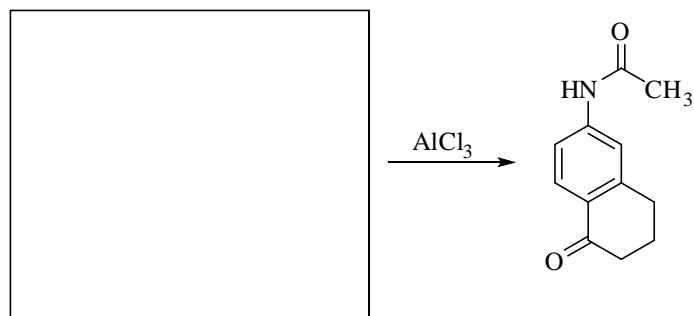
b)



c)

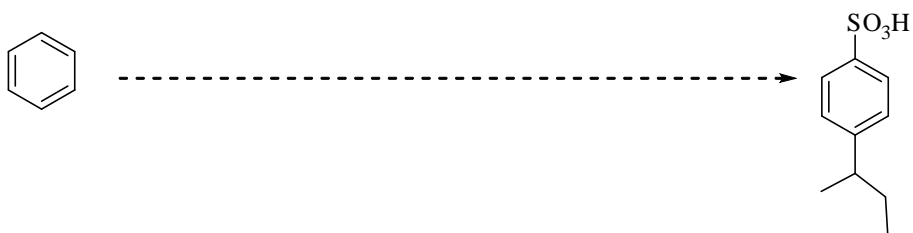


d)

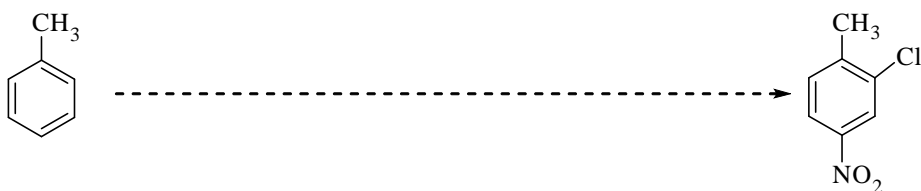


2. Suggest a synthesis to take the starting material on the left to the product on the right. This will require more than one step. You may use any inorganic reagent and any organic reagent of four carbons or less. (4 pts. each)

a)



b)



/20 total pts.