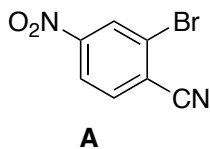
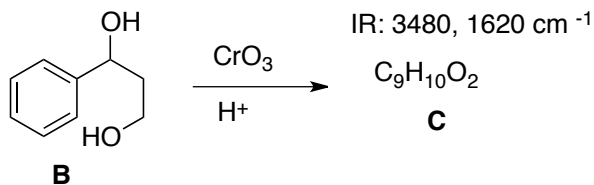


1. (10 points) Using any piece that contributes three or fewer carbons to the final product, and any monosubstituted benzene derivative that contributes at most one carbon to the final product, outline a synthesis of **A**.

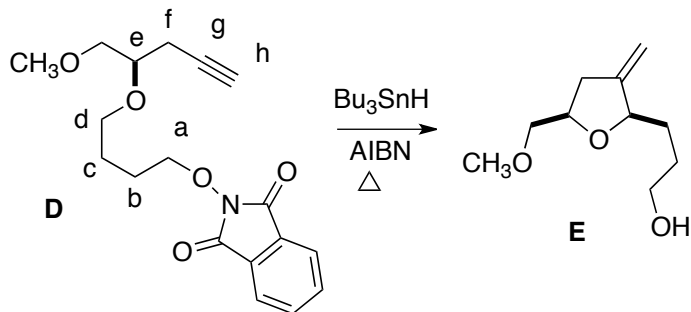


2. (10 points) Deduce the structure of **C**, and draw an arrow-pushing mechanism for its formation.



$^{13}\text{C}$ NMR	$^1\text{H}$ NMR
200.4, s	7.98, d, $J = 7.8$ Hz, 2H
136.6, s	7.60, m, 1H
133.5, d (2)	7.50, m, 2H
128.6, d	4.02, t, $J = 5.3$ Hz, 2H
128.0, d (d)	3.22, t, $J = 5.3$ Hz, 2H
58.0, t	2.87, bs, 1H (exchanges)
40.3, t	

3. (10 points) Draw an arrow-pushing mechanism for the conversion of **D** to **E**.



bb	bf
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