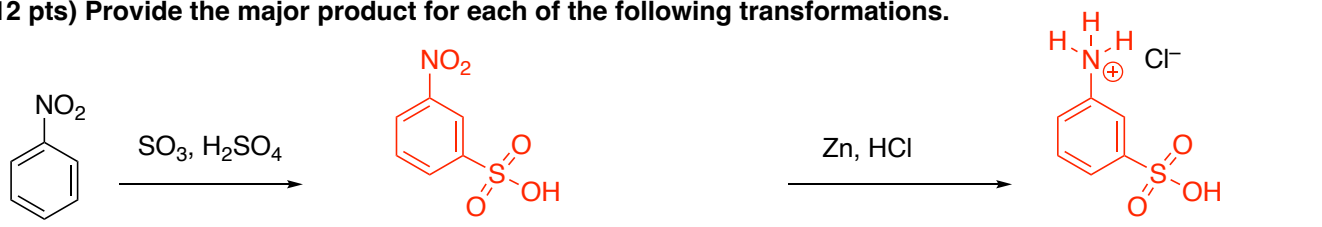
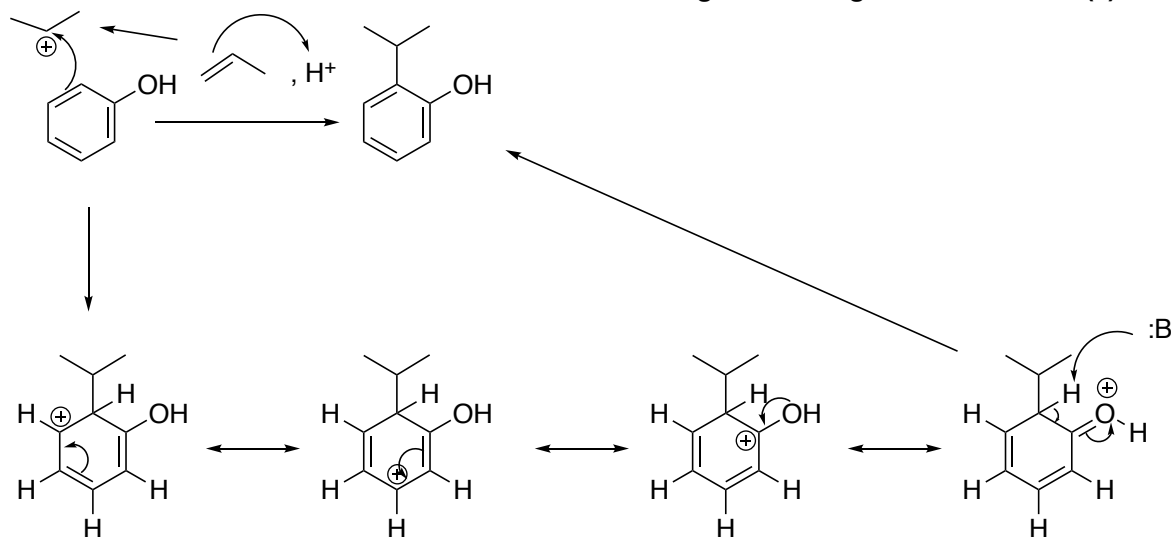


Name: Key

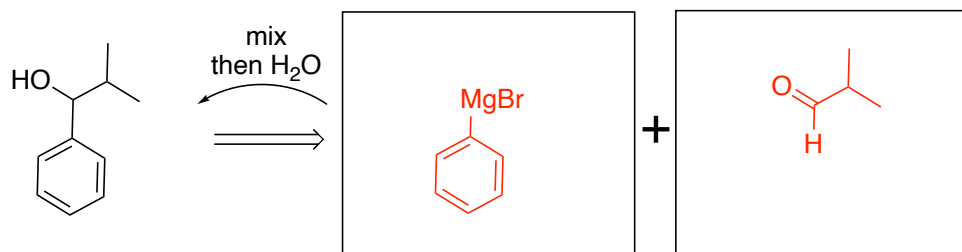
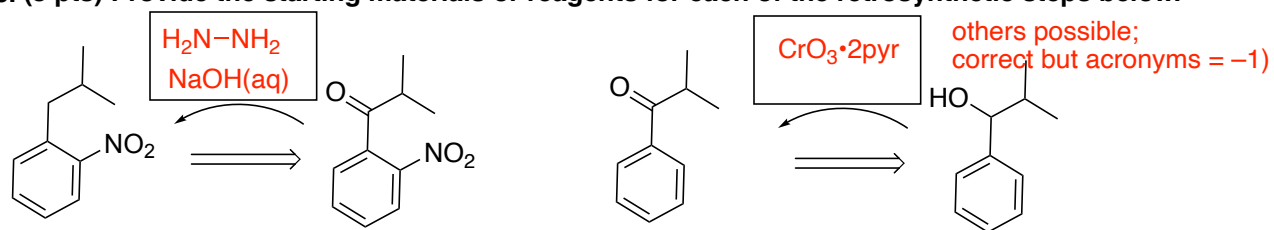
1. (12 pts) Provide the major product for each of the following transformations.



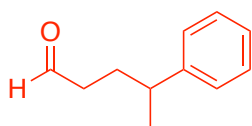
2. (12 pts) Provide a very detailed arrow pushing mechanism for the following EAS reaction. Include all resonance structures that show distribution of charge on the organic intermediate(s).



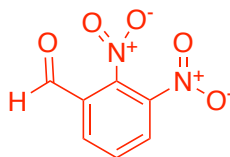
3. (8 pts) Provide the starting materials or reagents for each of the retrosynthetic steps below.



4. (4 pts) Provide the structure for the following compounds.



4-phenylpentanal



2,3-dinitrobenzaldehyde

5. (9 pts) Provide a retrosynthetic analysis of the following molecule, working backwards to starting materials of 6 carbons or less and any inorganic materials necessary.

