

## Midterm 1 Review Packet

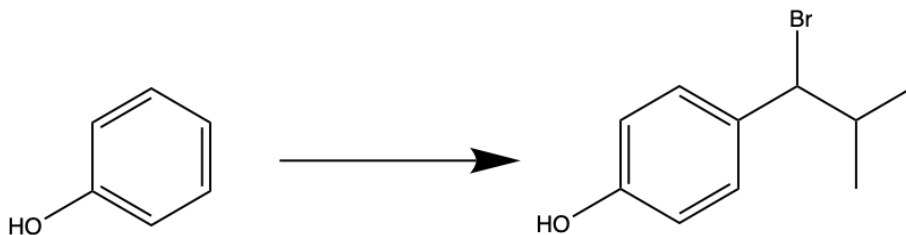
### Concepts Covered:

#### - **EAS**

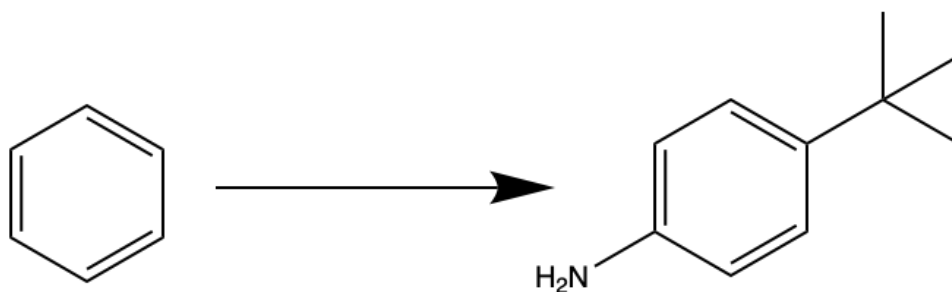
- Halogenation
- Nitration
- Sulfation
- Friedel-Crafts Alkylation/Acylation
  - Carbocation rearrangement
  
- Activating groups
  - Ortho/Para-directors
- Deactivating groups
  - Meta-directors
- Benzylic Bromination
- Reduction of ketones to  $\text{CH}_2$
- Multistep synthesis
- **Nucleophilic Aromatic Substitution**
  - Benzyne Chemistry

1. Provide the necessary reagents to produce the product with the given starting material

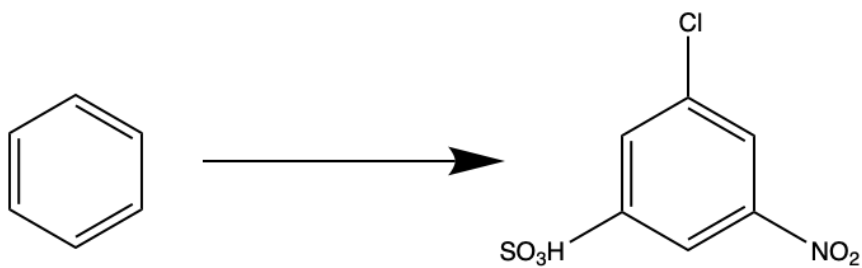
A.



B.

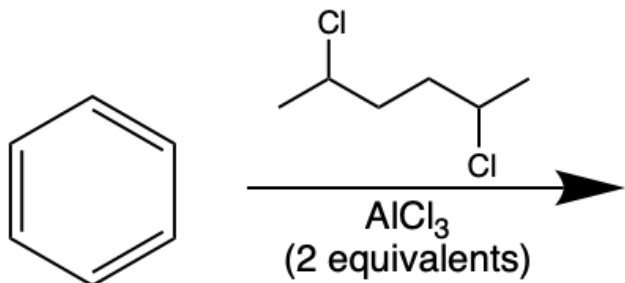


C.

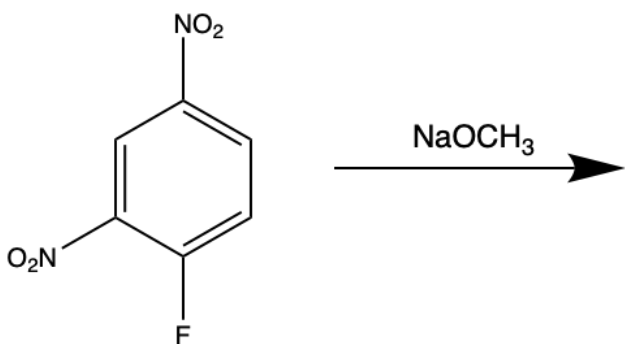


2. Provide the product produced by each of the following reactions

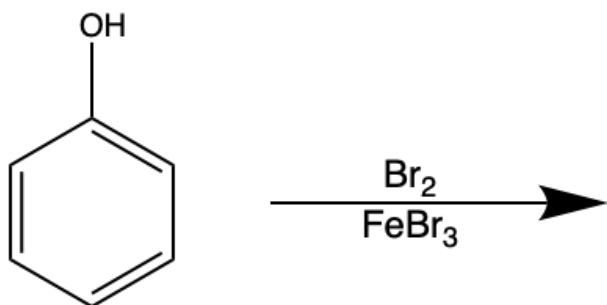
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B.

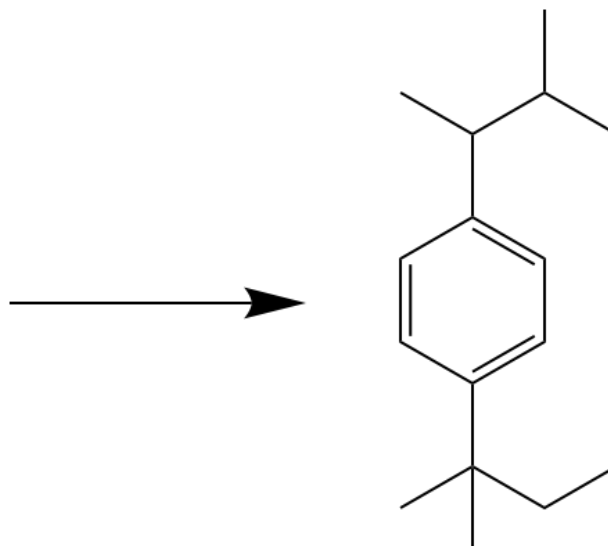


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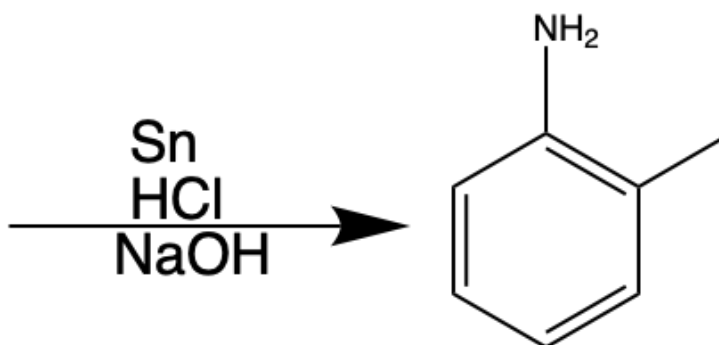


3. Provide the starting material for each of the following reactions

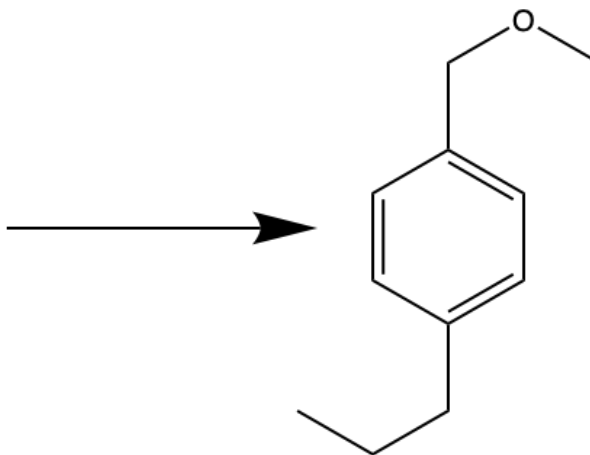
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B.

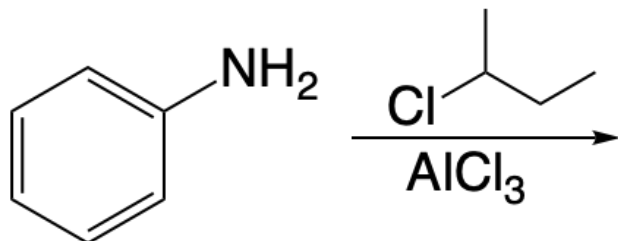


C.

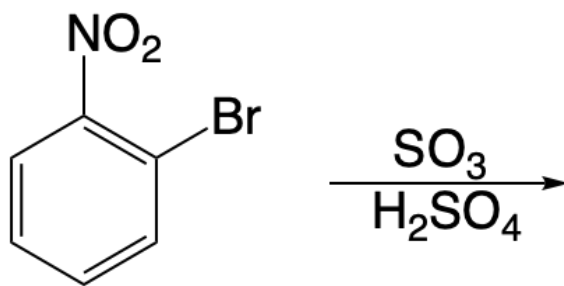


4. Determine whether the reactant will add ortho/para or meta and draw the product

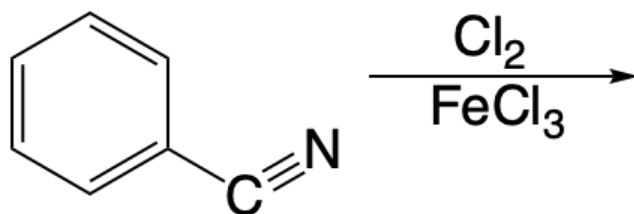
A.



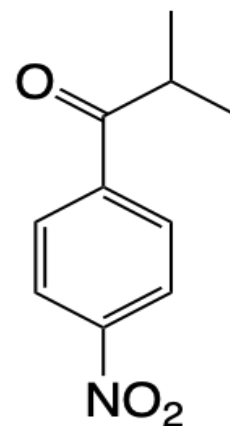
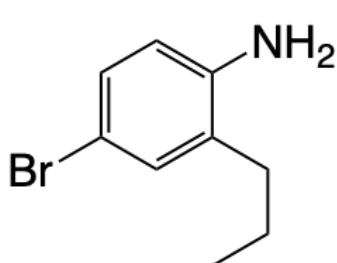
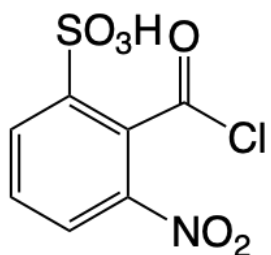
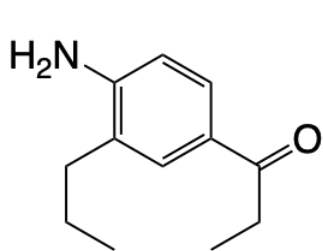
B.



C.



5. Which of the following product(s) are possible from a starting benzene



6. Show the mechanism for the following reaction

