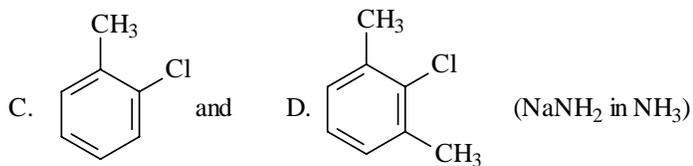
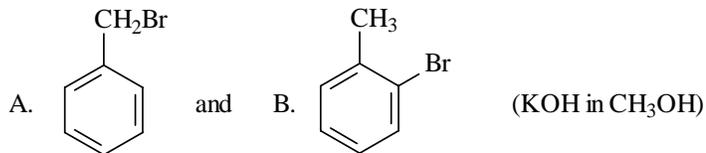
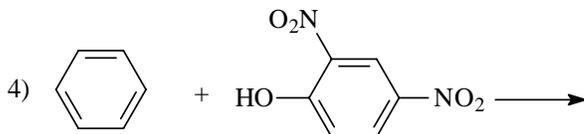
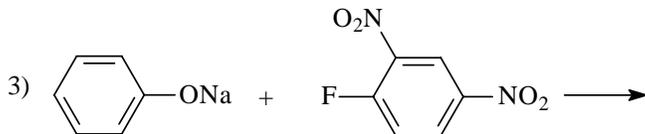
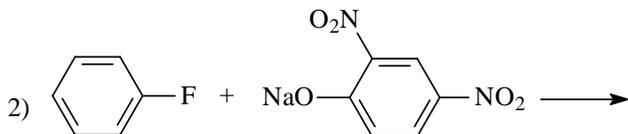
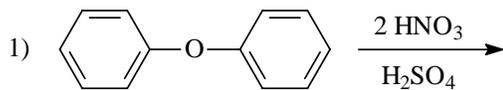
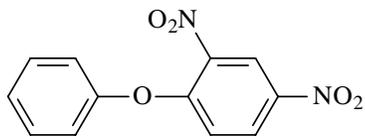


1. Which compound in each of the following pairs is the most reactive to the conditions indicated?



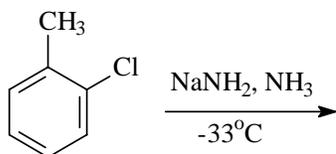
- 1) A and C      2) A and D      3) B and C      4) B and D

2. Which of the following would work best for the synthesis of the ether shown below?

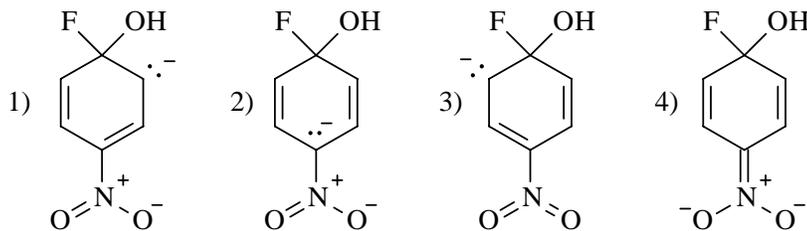


- 1) 1      2) 2      3) 3      4) 4

3. Which of the following is (are) true concerning the intermediate benzyne?
- A. Benzyne is aromatic.  
 B. All the hydrogens of benzyne are equivalent and indistinguishable.  
 C. The benzyne molecule has strain energy.
- 1) only A                    2) only C                    3) A and C                    4) B and C
4. Which one of the following has the fastest rate of reaction with sodium ethoxide,  $\text{NaOCH}_2\text{CH}_3$ , at  $25^\circ\text{C}$ ?
- 1) *para*-fluoronitrobenzene                    2) *para*-chloronitrobenzene  
 3) *para*-bromonitrobenzene                    4) *para*-iodonitrobenzene
5. Identify the product(s) of the following reaction.



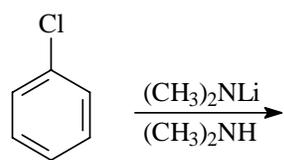
- 1) only *ortho*-methylaniline  
 2) *ortho*-methylaniline and *meta*-methylaniline  
 3) *meta*-methylaniline and *para*-methylaniline  
 4) *ortho*-methylaniline and *para*-methylaniline
6. Which of the following reacts at the fastest rate with potassium methoxide ( $\text{KOCH}_3$ ) in methanol?
- 1) fluorobenzene                    2) *p*-nitrofluorobenzene  
 3) *p*-fluorotoluene                    4) *p*-bromofluorobenzene
7. Which of the following is not a resonance form of the intermediate in the nucleophilic addition of hydroxide ion to *para*-fluoronitrobenzene?



- 1) 1                    2) 2                    3) 3                    4) 4



11. What is the product of the following reaction?



- 1) *N,N*-dimethylaniline
- 2) *para*-chloro-*N,N*-dimethylaniline
- 3) phenyllithium ( $\text{C}_6\text{H}_5\text{Li}$ )
- 4) *meta*-chloro-*N,N*-dimethylaniline