



# CHEMISTRY

## BOOKS - MS CHOUHAN CHEMISTRY (HINGLISH)

### REACTION OF AROMATIC COMPOUNDS

**Solved Problem**

1. Show how an acylium ion could be formed from acetic anhydride in the presence of  $AlCl_3$ .



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2. When benzene reacts with 1-chloro-2,2-dimethylpropane (neopentyl chloride) in the presence of aluminum chloride, the major product is 2-methyl-2-phenylbutane, not 2,2-

dimethyl-1-phenylpropane (neopentylbenzene).

Explain this result.



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3. Label each of the following aromatic rings as activated or deactivated based on the substituent attached, and state whether the group is an ortho-para or meta director.



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4. Write contributing resonance structures and the resonance hybrid for the arenium ion formed by benzaldehyde. Benzaldehyde undergoes nitration at the meta position.



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5. Starting with toluene, outline a synthesis of (a) 1-bromo-2-trichloromethylbenzene, (b) 1-bromo-3-trichloromethylbenzene, and (c) 1-bromo-4-trichloromethylbenzene.



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6. When either enantiomer of 3-chloro-1-butene ((R) or (S)) is subjected to hydrolysis, the products of the reaction are optically inactive. Explain these results.



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**Additional Objective Questions Single Correct Choice Type**

1. Which of the following will be most easily attacked by an electrophile?

A. 

B. 

C. 

D. 

**Answer: B**



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2. Presence of a nitro group in a benzene ring

A. activates the ring towards electrophilic substitution.

B. renders the ring basic.

C. deactivates the ring towards nucleophilic substitution.

D. deactivates the ring towards electrophilic substitution.

**Answer: D**



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3. The chlorination of toluene in presence of ferric chloride gives predominantly

- A. benzyl chloride
- B. m-chlorotoluene.
- C. benzal chloride
- D. o-and p-chlorotoluene

**Answer: D**



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4. Arrange in order of decreasing trend towards  $S_E$  (Substitution electrophilic) reactions: (I) Chlorobenzene (II) Benzene (III) Anilinium chloride (IV) Toluene

A. II gt I gt III gt IV

B. III gt I gt II gt IV

C. IV gt II gt I gt III

D. I gt II gt III gt IV

**Answer: C**



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5. In the reaction of 2-nitrotoluene with bromine in the presence of iron which of the products shown below is the most abundant in the mixture?



**Answer: B**



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6. Among the following statements on the nitration of aromatic compounds, the incorrect one is

A. The rate of nitration of benzene is almost the same as that of hexadeuterobenzene.

B. The rate of nitration of toluene is greater than that of benzene.

C. The rate of nitration of benzene is greater than that of hexadeuterobenzene.

D. Nitration is an electrophilic substitution reaction.

**Answer: C**



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7. Nitrobenzene can be prepared from benzene by using a mixture of cone.  $HNO_3$  and conc.  $H_2SO_4$ . In the nitrating mixture  $HNO_3$  acts as a

A. base

B. acid

C. reducing agent.

D. catalyst

**Answer: A**



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8. Which one of the following compounds undergoes bromination on its aromatic ring (electrophilic aromatic substitution) at the fastest rate ?

A. 

B. 

C. 

D. 

**Answer: B**



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9. The function of anhydrous  $AlCl_3$  in the friedel - craft reaction is to

- A. absorb water
- B. absorb HCl
- C. to produce electrophilic
- D. to produce nucleophile

**Answer: C**



## Additional Objective Questions Multiple Correct Choice Type

1. Toluene, when treated with  $Br_2 / Fe$ , gives p-bromotoluene as the major product, because the  $CH_3$  group

A. is para directing

B. is meta directing.

C. activates the ring by hyperconjugation



D. deactivates the ring

**Answer: A::C**



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2. In which of following reactions, electrophilic aromatic substitution take place on left hand side phenyl ring?

A. 

B. 

C. 

D. 

**Answer: B::C**



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