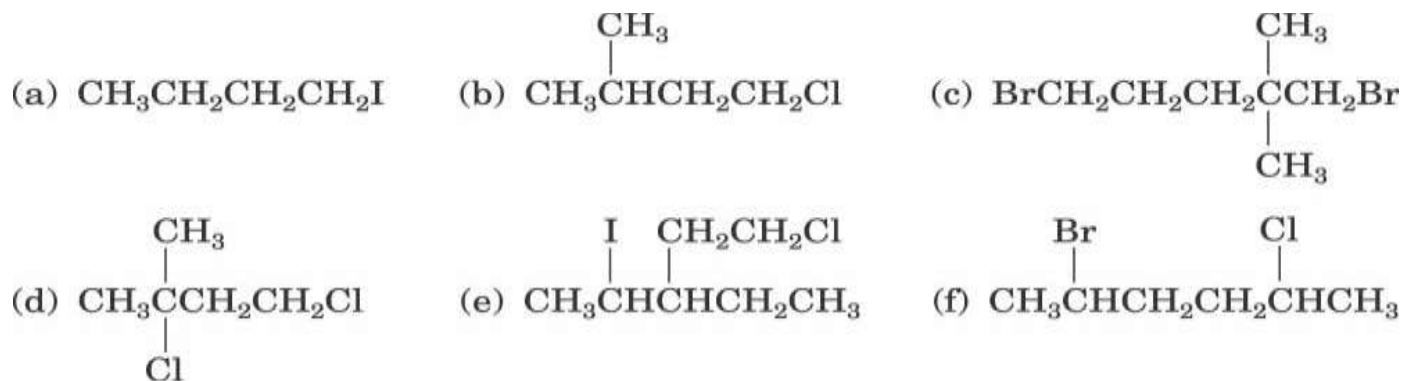


Question Bank
Chemistry Department
Theoretical Organic Chemistry
2nd Stage
First Semester
Dr. Muslih S. Hamasharif

Q1// Give IUPAC names for the following alkyl halides:



Q2// Draw structures corresponding to the following IUPAC names:

2-Chloro-3,3-dimethylhexane, 3,3-Dichloro-2-methylhexane,

3-Bromo-3-ethylpentane, 1,1-Dibromo-4-isopropylcyclohexane,

4-sec-Butyl-2-chlorononane, 1,1-Dibromo-4-*tert*-butylcyclohexane

Q3// Write the detail mechanism for:

1. Nitration of Benzene
1. Reaction of secondary alkyl halide bromide with water is $\text{S}_{\text{N}}1$ type.
2. Oxidation of primary alcohols

3. Sulfonation of benzene

Q4// Explaining the flaws in the Kekule model

Explaining the flaws in the Kekule model.

1. Why does benzene possess 152 kJ/mol less energy than predicted?

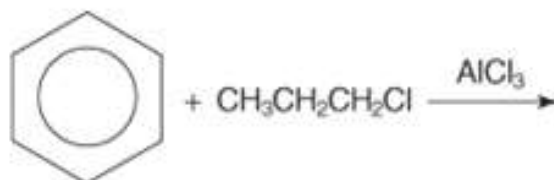
This missing energy, called resonance energy, is attributed to overlap of p-orbitals. Due to resonance, benzene is 152 kJ/mol more stable than calculations would predict.

2. Why does benzene resist addition and prefer substitution?

If benzene were to undergo addition, resonance would be disrupted and this would render the structure less stable. Therefore benzene prefers to substitute (Br for H) and maintain resonance.

Q5// benzene yield only one monosubstitution product, C_6H_5Y . only one bromobenzene, C_6H_5Br . Similarly only one chlorobenzene, C_6H_5Cl . Or one nitrobenzene, $C_6H_5NO_2$. From this fact we see each hydrogen must be exactly equivalent to each other hydrogen.

Q6// Complete the following reaction:



Q7// Write mechanism for the Friedel-Crafts Alkylation?

Q8// Draw structures corresponding to the following Inames:

A. 2,4,6-trinitrotoluene

B. *m*-Bromophenol

Q9// Write mechanism for the Nitration of Benzene?

Q10// Draw structures corresponding to the following Inames:

A. 3-Methyl-2-phenylhexane

B. *o*-Aminobenzoic acid

C. 2,4,6-Trinitrophenol

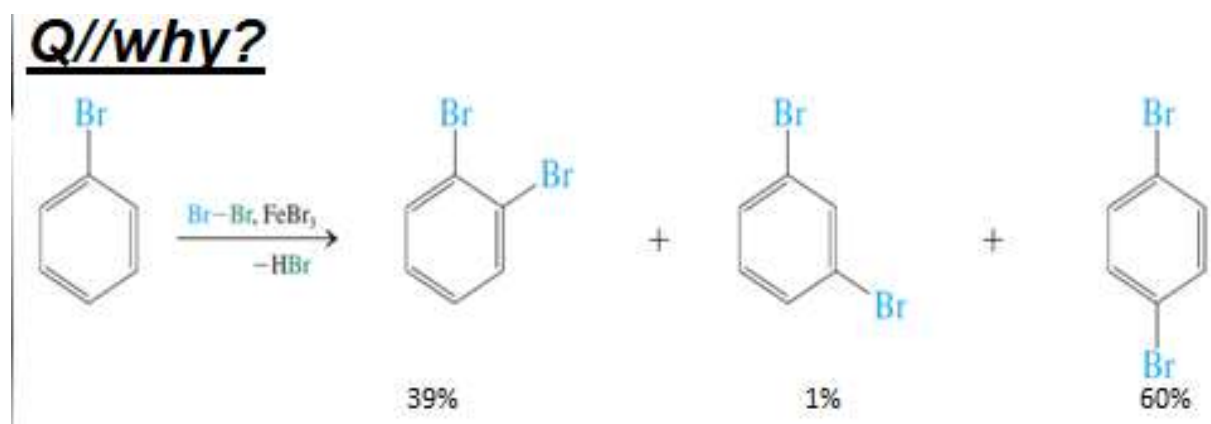
Q2/ Write mechanism for the Sulfonation of benzene?

Q11// Draw structures corresponding to the following Inames:

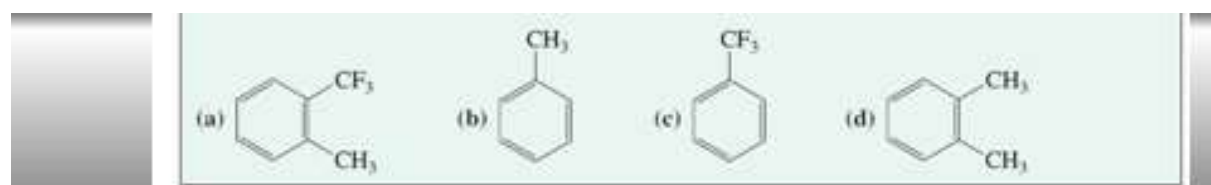
- A. 3-Methyl-2-phenylhexane
- B. *o*-Aminobenzoic acid
- C. 2,4,6-Trinitrophenol

Q12// Write mechanism for the Bromination of Benzene?

Q13// Explaining?



Q14// Rank these compounds in order of decreasing activity in electrophilic substitution.

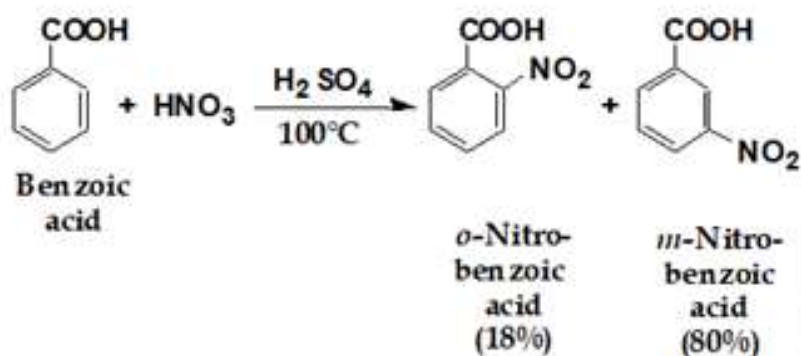


Q15// How many products might be formed on Nitration of *m*-nitrophenol? Explain?

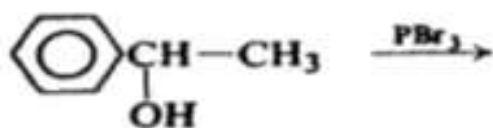
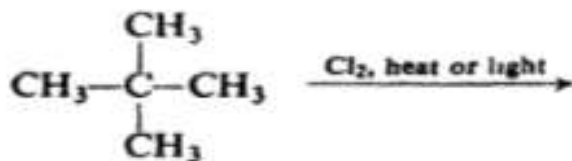
Q16// How many products might be formed on Chlorination of m-xylene? Explain?

Q17// Explaing?

Q2//Why



Q18// Complete the following reactions:



Q19// write mechanism for SN2?

Q20// Draw structures corresponding to the following IUPAC names:

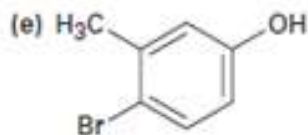
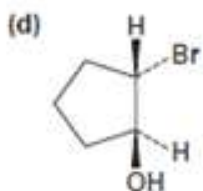
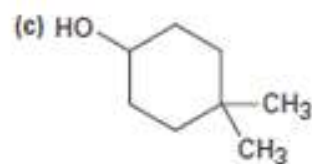
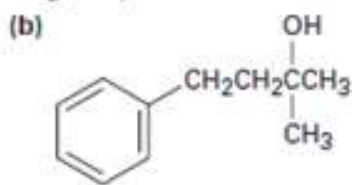
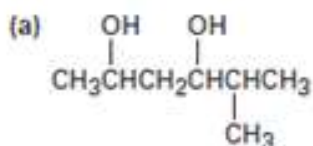
1- 2-Chloro-3,3-dimethylhexane

2- 3-Bromo-3-ethylpentane

3- 1,1-Dibromo-4-isopropylcyclohexane

Q21// write mechanism for SN1?

Q22// Give IUPAC names for the following:



Q23// Draw structures corresponding to the following IUPAC names:

(a) (Z)-2-Ethyl-2-buten-1-ol

(b) 3-Cyclohexen-1-ol

(c) *trans*-3-Chlorocycloheptanol

(d) 1,4-Pentanediol

(e) 2,6-Dimethylphenol

(f) *o*-(2-Hydroxyethyl)phenol

Q24// Boiling point of alcohol increase by increase the M.wt. Why??

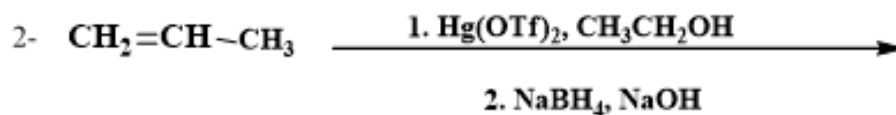
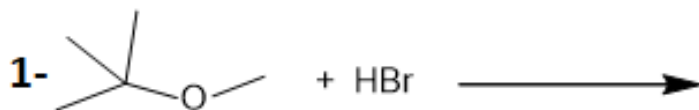
Q25//Which is more acidic:

1-Methanol or water?

2- alcohol or acetylene?

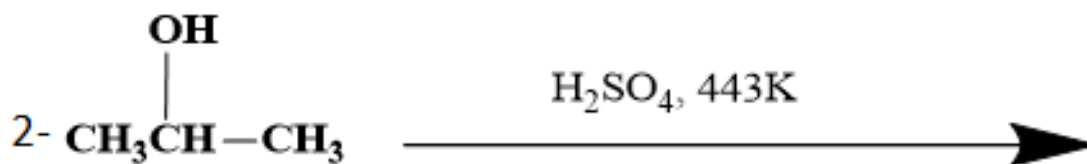
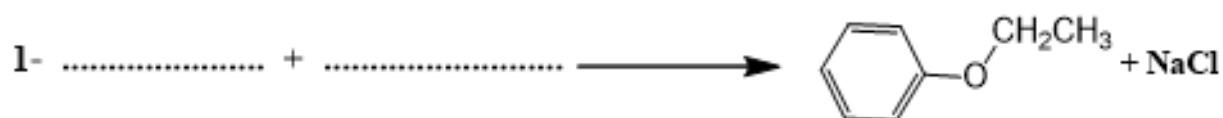
3-Phenols or alcohols?

Q26// Complete the following reaction:



Q27// Write the detail mechanism for reactions of Ethers by Strong Acids.

Q28// Complete the following reactions:



Q29// Write the detail mechanism for reactions of Ethers by Strong Acids.



Good Luck