

# CHEMISTRY STUDY MATERIALS FOR CLASS 12

## (NCERT Exemplar Problems of Chapter - 10)

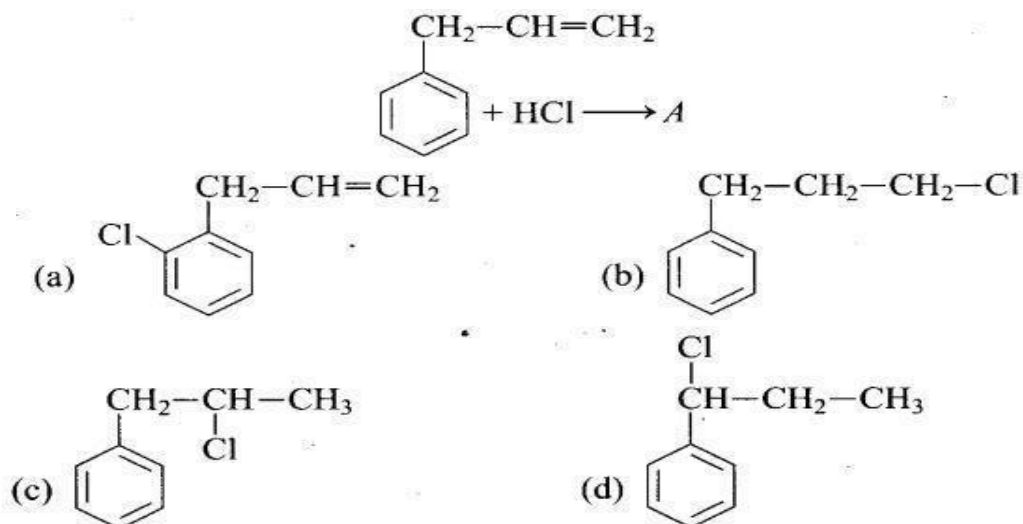
GANESH KUMAR

DATE:- 09/09/2021

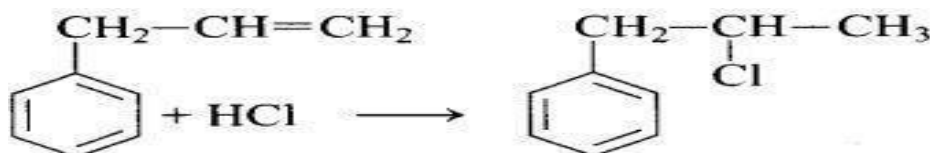
### Haloalkanes and Haloarenes

#### Multiple Choice Questions (Single Correct Answer Type)

Question 14. What is A in the following reaction?



**Solution:** (c) In this reaction, addition of HCl takes place on doubly bonded carbons in accordance with Markovnikov's rule i.e., addition of negative addendum will take place on that carbon which has lesser number of hydrogen.



Question 15. A primary alkyl halide would prefer to undergo.

- (a)  $\text{S}_\text{N}^1$  reaction   (b)  $\text{S}_\text{N}^2$  reaction   (c)  $\alpha$ -Elimination   (d) Racemisation

**Solution:** (b)  $\text{S}_\text{N}^2$  reaction proceeds via formation of transition state which is formed easily in primary alkyl halide due to less steric hindrance.

Question 16. Which of the following alkyl halides will undergo  $\text{S}_\text{N}^1$  reaction most rapidly?

- (a)  $(\text{CH}_3)_3\text{C-F}$    (b)  $(\text{CH}_3)_3\text{C-Cl}$    (c)  $(\text{CH}_3)_3\text{C-Br}$    (d)  $(\text{CH}_3)_3\text{C-I}$

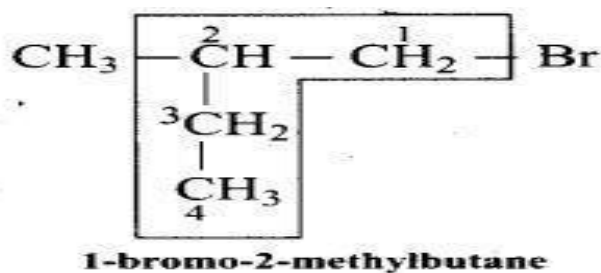
**Solution:** (d)  $(\text{CH}_3)_3\text{C-I}$  will undergo  $\text{S}_\text{N}^1$  reaction most readily as C-I bond is weakest, due to the large difference in the size of carbon and iodine.

**Question 17.**

Which is the correct IUPAC name of  $\text{CH}_3-\underset{\text{C}_2\text{H}_5}{\text{CH}}-\text{CH}_2-\text{Br}$  ?

- (a) 1-Bromo-2-ethylpropane
- (b) 1-Bromo-2-ethyl-2-methylethane
- (c) 1-Bromo-2-methylbutane
- (d) 2-Methyl-1-bromobutane

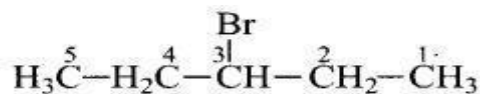
**Solution:** (c) The correct IUPAC name of the given compound is



**Q18.** What should be the correct IUPAC name for diethylbromomethane?

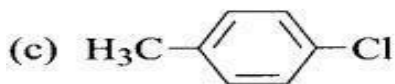
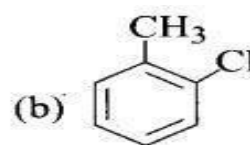
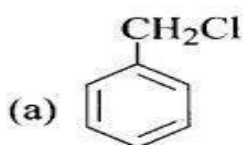
- (a) 1-Bromo-1, 1-diethylmethane
- (b) 3-Bromopentane
- (c) 1-Bromo-1-ethylpropane
- (d) 1-Bromopentane

**Solution:** (b) Diethylbromomethane is



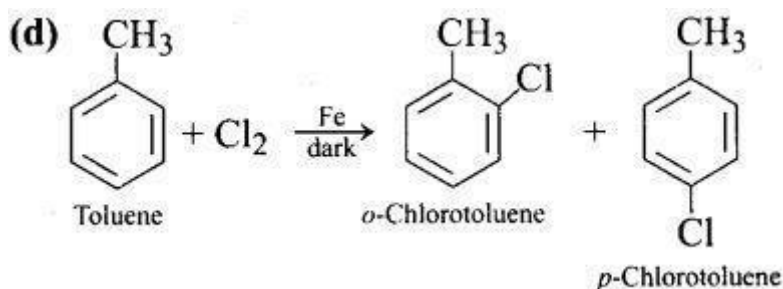
Its IUPAC name is 3-bromopentane.

**Question 19.** The reaction of toluene with chloride in the presence of iron and in the absence of light yields



(d) mixture of (b) and (c)

**Solution:**

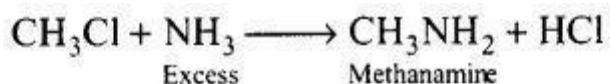


**Ques.20. Chloromethane on treatment with excess of ammonia yields mainly**

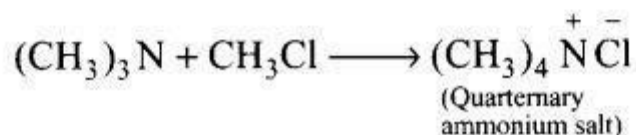
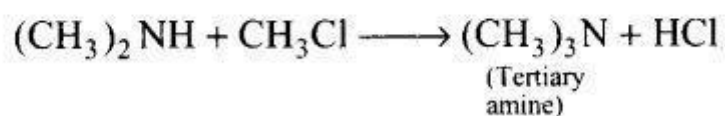
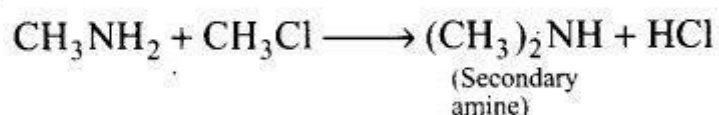
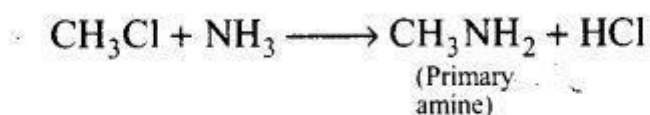
- (a) N, N-Dimethylmethanamine  $\left(\text{CH}_3-\text{N}\begin{matrix} \text{CH}_3 \\ \text{CH}_3 \end{matrix}\right)$   
(b) N-methylmethanamine  $(\text{CH}_3-\text{NH}-\text{CH}_3)$   
(c) methanamine  $(\text{CH}_3\text{NH}_2)$   
(d) mixture containing all these in equal proportion.

**Solution:** (c) Methanamine.  $\text{CH}_3\text{Cl} + \text{NH}_3 \rightarrow \text{CH}_3\text{NH}_2 + \text{HCl}$

Excess Methanamine. However, if the two reactants are present in the same amount, the mixture of primary, secondary and tertiary amine is obtained.

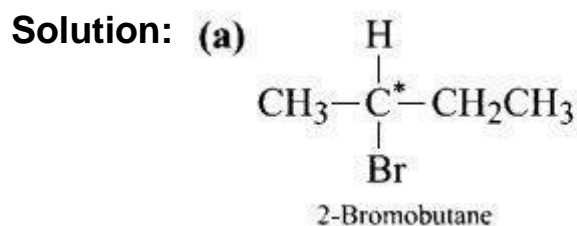


However, if the two reactants are present in the same amount, the mixture of primary, secondary and tertiary amine is obtained.



**Question 21. Molecules whose mirror image is non super imposable over them are known as chiral. Which of the following molecule is chiral in nature?**

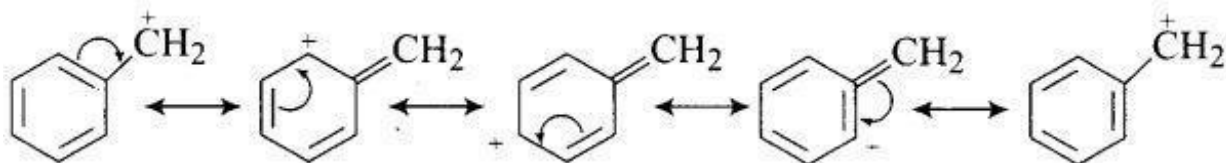
- (a) 2-Bromobutane                      (b) 1-Bromobutane  
(c) 2-Bromopropane                    (d) 2-Bromopropan-2-ol



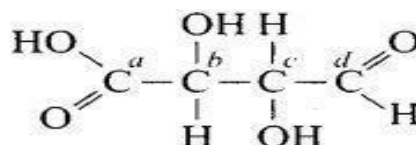
**Question 22. Reaction of  $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$  with aqueous sodium hydroxide follows**

- (a)  $\text{S}_\text{N}^1$  mechanism                      (b)  $\text{S}_\text{N}^2$  mechanism  
(c) Wurtz reaction                        (d) Saytzeff rule

**Solution:** (a)  $C_6H_5CH_2Br$  will follow  $S_N1$  mechanism. Benzylic halides show high reactivity towards the  $S_N1$  reaction. The carbocation thus formed gets stabilized through resonance as shown in the structure.



**Question 23.** Which of the carbon atoms present in the molecule given below are asymmetric?

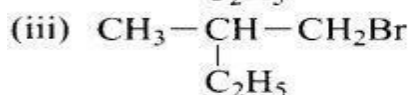
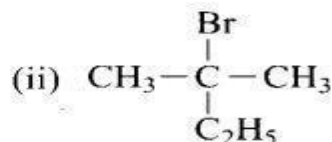
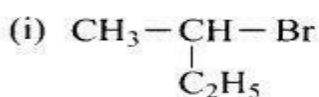


- (a) a, b, c, d  
(c) a, d

- (b) b, c  
(d) a, b, c

**Solution:** (b) Carbon has four valencies. If a carbon atom satisfies all of its four valencies with four different groups then it is termed asymmetric/chiral carbon. In the given compound, b and c carbon are bonded to four different groups, so these are asymmetric.

**Question 25.** Which of the following compounds will give racemic mixture on nucleophilic substitution by  $OH^-$  ion?



- (a) (i)                      (b) (i), (ii), (iii)      (c) (ii), (iii)              (d) (i), (iii)

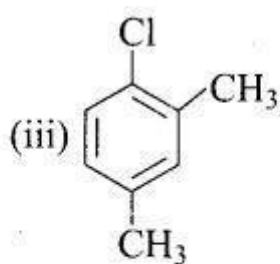
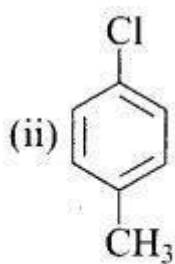
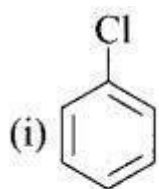
**Solution:**

(a)  $CH_3-\underset{\substack{| \\ C_2H_5}}{CH}-Br$  will give a racemic mixture on nucleophilic substitution

by  $OH^-$  ion since the alkyl halide has a chiral carbon atom. During the  $S_N1$  reaction a mixture of enantiomers is formed which are present in equal proportions.



**Question 29.**



(a) (i) < (ii) < (iii)

(c) (iii) < (ii) < (i)

(b) (ii) < (i) < (iii)

(d) (i) < (iii) < (ii)

**Solution:**(c) Electron releasing group increase the reactivity of aryl halides, less is the number of electron releasing group, the less is rate towards nucleophilic substitution.

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