

# CHEMISTRY STUDY MATERIALS FOR CLASS 12

## (NCERT Exemplar Problems of Chapter - 10)

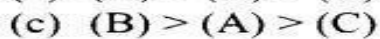
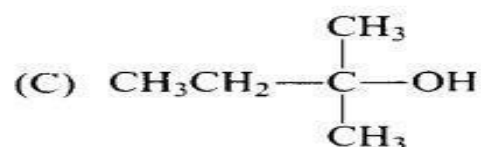
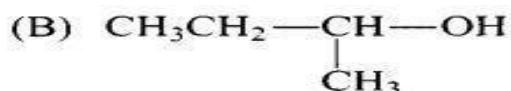
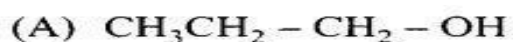
GANESH KUMAR

DATE:- 08/09/2021

### Haloalkanes and Haloarenes

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

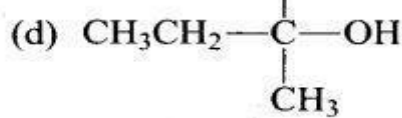
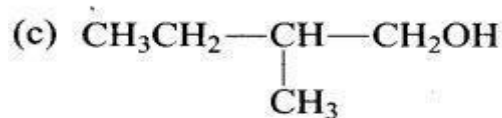
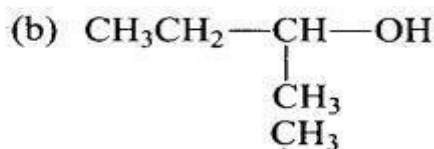
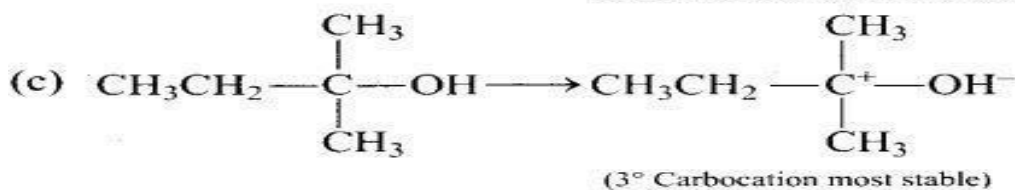
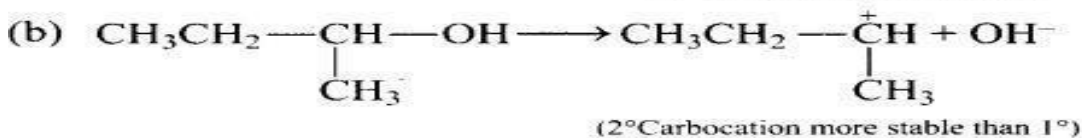
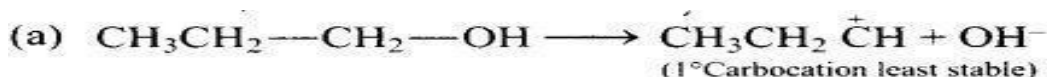
Question1. The order of reactivity of following alcohols with halogen acids is



**Solution:** (b) The reactivity order of alcohols towards halogen acids is

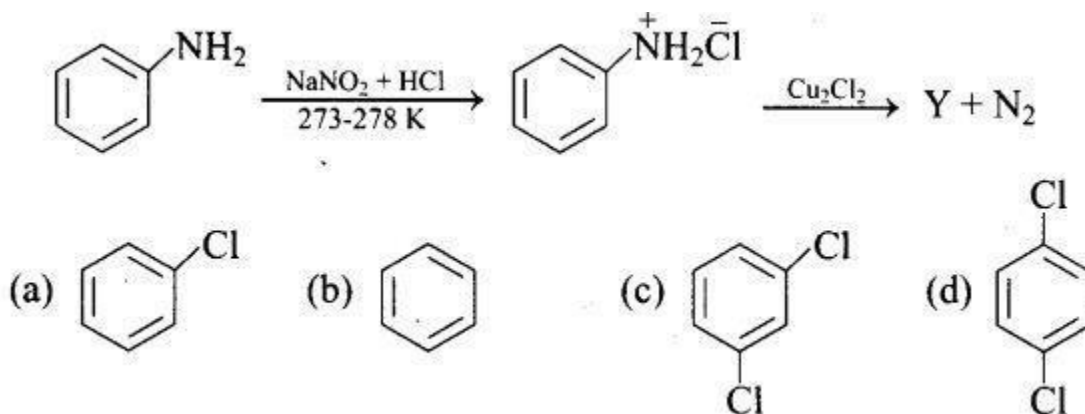
$3^\circ > 2^\circ > 1^\circ$ , since the stability of carbocations is of the order  $3^\circ > 2^\circ > 1^\circ$ .

Question2. Which of the following alcohol will yield the corresponding alkyl chloride on reaction with concentrated HCl at room temperature?

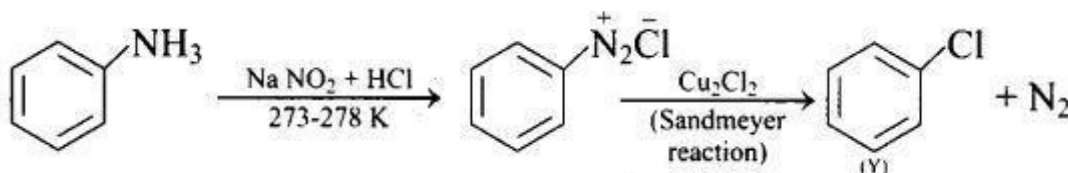


**Solution:** (d) As tertiary carbocation is most stable, so tertiary alcohols are most reactive towards conc. HCl. Hence, the reaction can be conducted at room temperature only, while primary and secondary alcohols require the presence of a catalyst  $\text{ZnCl}_2$ .

**Question 3. Identify the compound Y in the following reaction:**



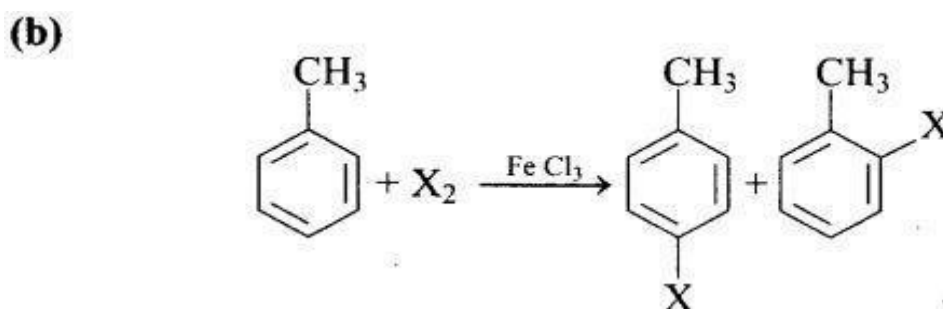
**Solution:** (a) When a primary aromatic amine, dissolved or suspended in cold aqueous mineral acid and treated with sodium nitrite, a diazonium salt is formed. When this freshly prepared diazonium salt is mixed with cuprous chloride, diazonium group is replaced by -Cl. Then chlorobenzene is formed which is Y in this reaction.



**Question 4. Toluene reacts with a halogen in the presence of iron (III) chloride giving ortho and para halo compounds. The reaction is**

- (a) electrophilic elimination reaction
- (b) electrophilic substitution reaction
- (c) free radical addition reaction
- (d) nucleophilic substitution reaction

**Solution:**



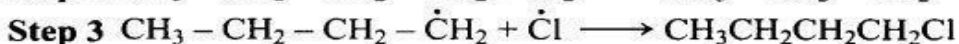
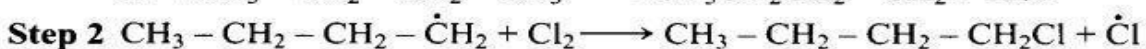
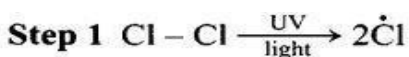
This is an example of electrophilic substitution reaction.

**Question 5. Which reagent will you use for the following reaction?**

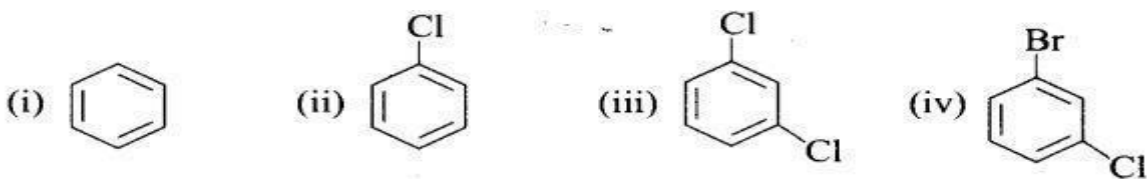


- (a)  $\text{Cl}_2/\text{UV light}$
- (b)  $\text{NaCl} + \text{H}_2\text{SO}_4$
- (c)  $\text{Cl}_2$  gas in dark
- (d)  $\text{Cl}_2$  gas in the presence of iron in dark

**Solution:** (a) The given reaction is a free radical substitution reaction. It occurs in presence of ultraviolet light or at high temperature or peroxides which are free radical generators. Free radical substitution cannot take place in dark.



**Question 6. Arrange the following compounds in the increasing order of their densities Cl**

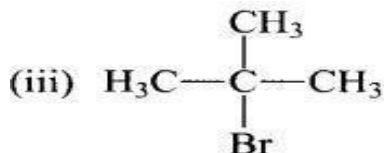
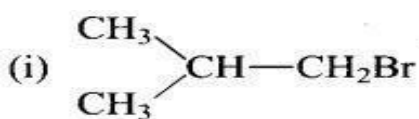


- (a) (i) < (ii) < (iii) < (iv)
- (b) (i) < (iii) < (iv) < (ii)
- (c) (iv) < (iii) < (ii) < (i)
- (d) (ii) < (iv) < (iii) < (i)

**Solution:** (a) Density increases with increase in molecular mass.

**Question 7. Benzene < Chlorobenzene < Dichlorobenzene < Bromochlorobenzene**

**Arrange the following compounds in increasing order of their boiling points**

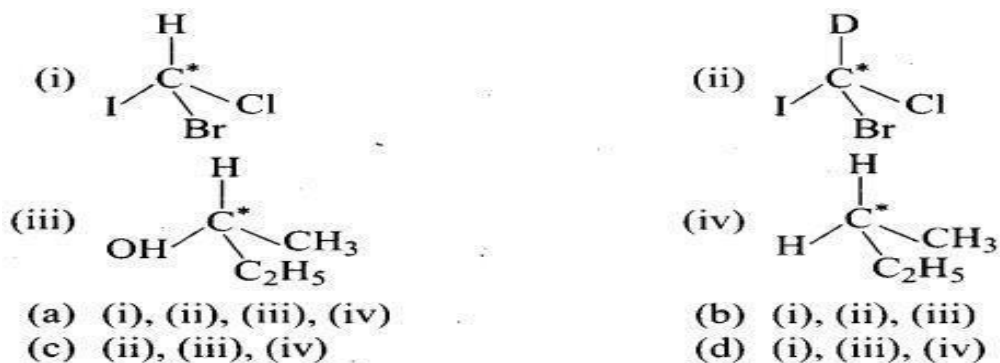


- (a) (ii) < (i) < (iii)
- (c) (iii) < (i) < (ii)

- (b) (i) < (ii) < (iii)
- (d) (iii) < (ii) < (i)

**Solution:** (c) Boiling points of isomeric haloalkanes decrease with increase in branching as with increase in branching surface area decreases which leads to decrease in intermolecular forces.

**Question 8.** In which of the following molecules carbon atom marked with asterisk (\*) is

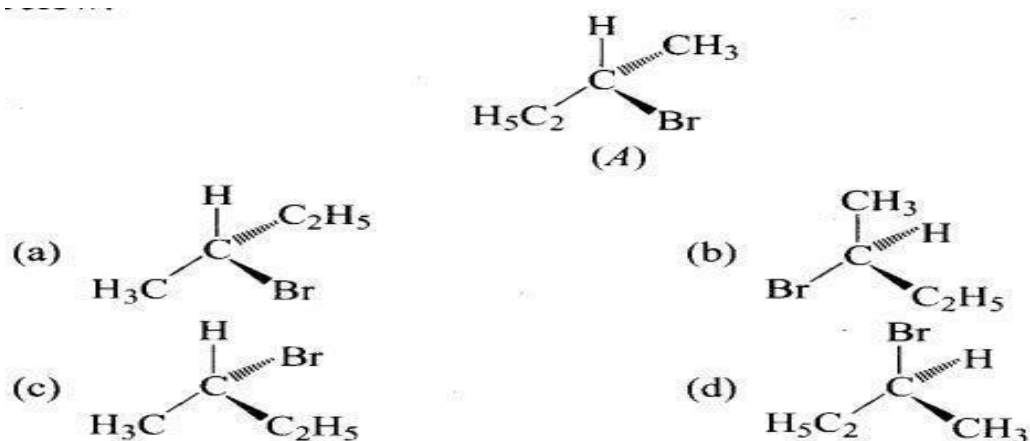


**Solution:** (b) Asymmetric/chiral carbon atom is that in which all of its four valencies with four different groups or atoms.

In molecules (i), (ii) and (iii), all have asymmetric carbon as each carbon has satisfied all four valencies with four different groups or atoms.

In molecule (iv), carbon satisfies two of its valencies with two hydrogen atoms i.e., similar atom. So, it is not an asymmetric carbon atom.

**Question 9.** Which of the following structure is enantiomeric with the molecule (A) given below:

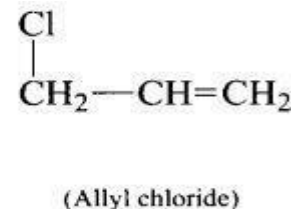
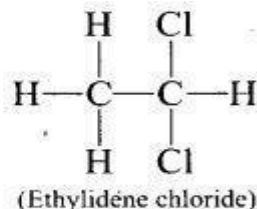
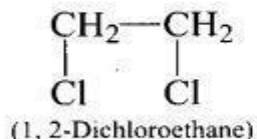


**Solution:** (a) Compound (a) is enantiomer of compound (A) because the configuration of two groups, i.e.,  $\text{CH}_3$  and  $\text{C}_2\text{H}_5$  in them is reversed at the chiral carbon.

**Question 10.** Which of the following is an example of vic-dihalide?

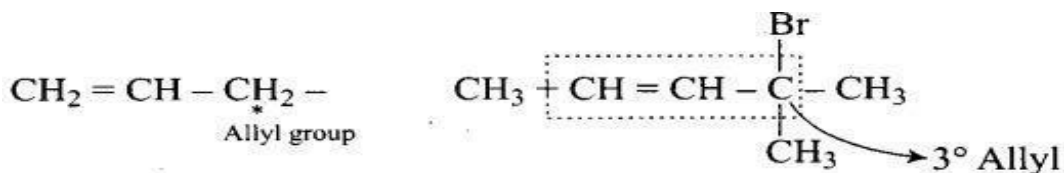
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|-------------------------|-------------------------|
| (a) Dichloromethane     | (b) 1, 2-dichloroethane |
| (c) Ethylidene chloride | (d) Allyl chloride      |

**Solution:** (b) 1, 2-Dichloroethane is a vic-dihalide since two Cl atoms are present on vicinal carbon atoms (adjacent).



**Question 11.** The position of -Br in the compound  $\text{CH}_3\text{CH} - \text{CHC}(\text{Br})(\text{CH}_3)_2$ , can be classified as .(a) allyl (b) aryl (c) vinyl (d) secondary

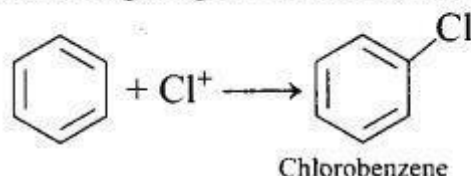
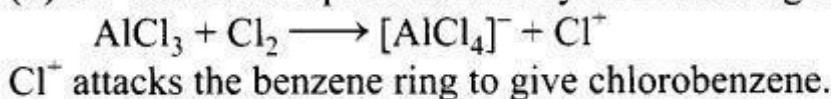
**Solution:** (a) It is allylic compound in which Br is attached next to double bonded c.



**Question 12.** Chlorobenzene is formed by reaction of chlorine with benzene in the presence of  $\text{AlCl}_3$ . Which of the following species attacks the benzene ring in this reaction?

- (a)  $\text{Cl}^-$       (b)  $\text{Cl}^+$       (c)  $\text{AlCl}_3$       (d)  $[\text{AlCl}_4]^-$

**Solution:** (b)  $\text{Cl}^+$  is an electrophile formed by the following reaction.



**Question 13.** Ethyldiene chloride is a/an;

- (a) vic-dihalide      (b) gem-dihalide      (c) allylic halide      (d) vinylic halide

**Solution:** (b) Ethyldiene chloride is a gem-dihalide,  $\text{CH}_2 = \text{CHCl}_2$  in which both halogen atoms are attached to the same carbon atom.

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