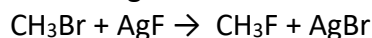


1. The synthesis of alkyl fluorides is best accomplished by

- (a) Finkelstein reaction
- (b) Swart's reaction
- (c) free radical fluorination
- (d) Sandmeyer's reaction.

Solution:

Alkyl fluorides are more conveniently prepared indirectly by heating suitable chloro or bromoalkanes with inorganic fluorides.



This reaction is called Swart's reaction.

Hence option (b) is the answer.

2. The optically inactive compound from the following is

- (a) 2-chloropropanal
- (b) 2-chloropentane
- (c) 2-chlorobutane
- (d) 2-chloro-2-methylbutane.

Solution:

Since there is no chiral center, 2-chloro-2-methylbutane is optically inactive.

Hence option (d) is the answer.

3. Which one of the following is likely to give a precipitate with AgNO_3 solution?

- (a) $(\text{CH}_3)_3\text{CCl}$
- (b) CHCl_3
- (c) $\text{CH}_2=\text{CH}-\text{Cl}$
- (d) CCl_4

Solution:

Tert-butyl chloride forms most stable 3° carbocation. So will give white precipitate of AgCl with AgNO_3 solution immediately.

Hence option (a) is the answer.

4. A solution of (-)-1-chloro-1-phenylethane in toluene racemises slowly in the presence of a small amount of SbCl_5 , due to the formation of

- (a) free radical
- (b) carbanion
- (c) carbene
- (d) carbocation

Solution:

During racemisation, carbocation intermediate is formed.
Hence option (d) is the answer.

5. What is DDT among the following?

- (a) A fertilizer
- (b) Biodegradable pollutant
- (c) Non-biodegradable pollutant
- (d) Greenhouse gas

Solution:

DDT (Dichloro diphenyl trichloroethane) is a non-biodegradable pollutant. The non-biodegradable pollutants cannot be broken down into simpler, harmless substances in nature.
Hence option (c) is the answer.

6. The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid is

- (a) gammexene
- (b) DDT
- (c) freon
- (d) hexachloroethane.

Solution:

The compound formed on heating chlorobenzene with chloral in the presence of concentrated sulphuric acid is DDT.
Hence option (b) is the answer.

7. Iodoform can be prepared from all except

- (a) isopropyl alcohol
- (b) 3-methyl-2-butanone
- (c) isobutyl alcohol
- (d) ethyl methyl ketone.

Solution:

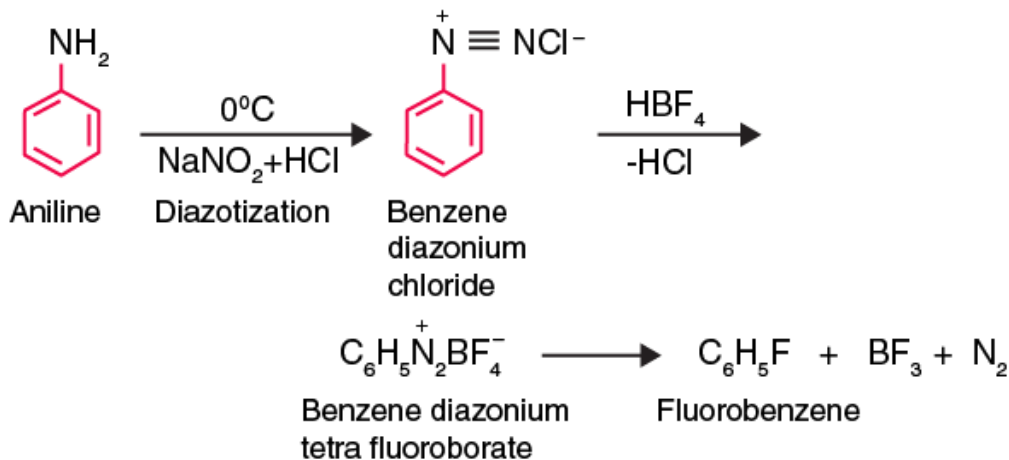
All the compounds except isobutyl alcohol will form iodoform.
Hence option (c) is the answer.

8. Fluorobenzene (C_6H_5F) can be synthesised in the laboratory

- (a) by heating phenol with HF and KF
- (b) from aniline by diazotization followed by heating the diazonium salt with HF_4
- (c) by direct fluorination of benzene with F_2 gas
- (d) by reacting bromobenzene with NaF solution.

Solution:

Fluorobenzene (C_6H_5F) can be synthesised in the laboratory from aniline by diazotization followed by heating the diazonium salt with BF_4 .



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Hence option (b) is the answer.

9. Alkyl halides react with dialkyl copper reagents to give

- (a) alkenes
- (b) alkyl copper halides
- (c) alkanes
- (d) alkenyl halides.

Solution:



Alkyl halide reacts with dialkyl copper reagents to give alkanes. It is called Corey House synthesis of alkane.

Hence option (c) is the answer.

10. The major organic compound formed by the reaction of 1,1,1-trichloroethane with silver powder is

- (a) 2-butene
- (b) acetylene
- (c) ethene
- (d) 2-butyne

Solution:

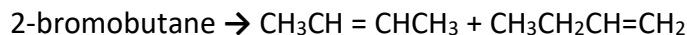
2- butyne is formed by the reaction of 1,1,1-trichloroethane with silver powder.

Hence option (d) is the answer.

11. Elimination of bromine from 2-bromobutane results in the formation of

- (a) equimolar mixture of 1 and 2-butene
- (b) predominantly 2-butene
- (c) predominantly 1-butene
- (d) predominantly 2-butyne.

Solution:



The major product follows Saytzeff rule.

Hence option (b) is the answer.

12. Which of the following will have a meso-isomer also?

- (a) 2-chlorobutane
- (b) 2,3-dichlorobutane
- (c) 2,3-dichloropentane
- (d) 2-hydroxypropanoic acid

Solution:

Because of the presence of plane of symmetry, 2,3-dichlorobutane have meso isomer.

Hence option (b) is the answer.

13. The organic chloro compound, which shows complete stereochemical inversion during a S_N2 reaction, is

- (a) CH_3Cl
- (b) $(\text{C}_2\text{H}_5)_2\text{CHCl}$
- (c) $(\text{CH}_3)_3\text{CCl}$
- (d) $(\text{CH}_3)_2\text{CHCl}$

Solution:

In S_N2 reactions, the nucleophile attacks from the backside resulting in the inversion of molecule. As we move from 1° alkyl halide to 3° alkyl halide, the crowding increases and +I effect increases. This causes the carbon-bearing halogen less positively polarised. So it is less readily attacked by the nucleophile.

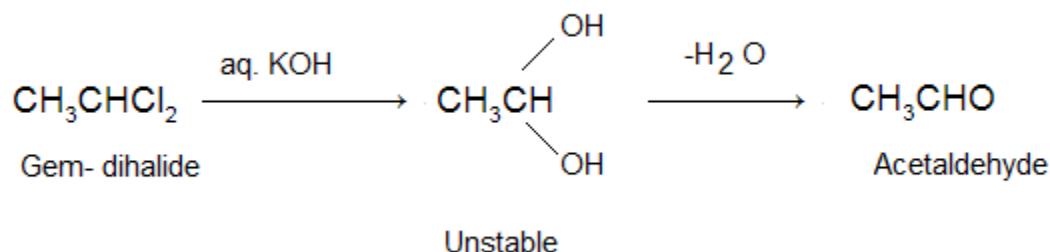
Hence option (a) is the answer.

14. Which of the following on heating with aqueous KOH produces acetaldehyde?

- (a) CH_3COCl
- (b) $\text{CH}_3\text{CH}_2\text{Cl}$
- (c) $\text{CH}_2\text{ClCH}_2\text{Cl}$
- (d) CH_3CHCl_2

Solution:

CH_3CHCl_2 on heating with aqueous KOH produces acetaldehyde.



Hence option (d) is the answer.

15. In $\text{S}_{\text{N}}2$ reactions, the correct order of reactivity for the following compounds: CH_3Cl , $\text{CH}_3\text{CH}_2\text{Cl}$, $(\text{CH}_3)_2\text{CHCl}$ and $(\text{CH}_3)_3\text{CCl}$ is

- (a) $(\text{CH}_3)_2\text{CHCl} > \text{CH}_3\text{CH}_2\text{Cl} > \text{CH}_3\text{Cl} > (\text{CH}_3)_3\text{CCl}$
- (b) $\text{CH}_3\text{Cl} > (\text{CH}_3)_2\text{CHCl} > \text{CH}_3\text{CH}_2\text{Cl} > (\text{CH}_3)_3\text{CCl}$
- (c) $\text{CH}_3\text{Cl} > \text{CH}_3\text{CH}_2\text{Cl} > (\text{CH}_3)_2\text{CHCl} > (\text{CH}_3)_3\text{CCl}$
- (d) $\text{CH}_3\text{CH}_2\text{Cl} > \text{CH}_3\text{Cl} > (\text{CH}_3)_2\text{CHCl} > (\text{CH}_3)_3\text{CCl}$

Solution:

Reactivity in $\text{S}_{\text{N}}2$ is inversely proportional to steric hindrance.

Hence the correct order of reactivity is $\text{CH}_3\text{Cl} > \text{CH}_3\text{CH}_2\text{Cl} > (\text{CH}_3)_2\text{CHCl} > (\text{CH}_3)_3\text{CCl}$

Hence option (c) is the answer.

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