SmartKalike

CBSE Class 12 · Chemistry

Haloalkanes and Haloarenes

10 most probable questions for Boards 2027

Q1. 1 mark · Multiple choice

Which reagent is preferred for preparing a pure alkyl chloride from an alcohol?
(A) Concentrated HCl alone
(B) $SOCl_2$
(C) NaCl
(D) NaI

Answer

(B) $SOCl_2$ — SO_2 and HCl gases escape, leaving pure alkyl halide.

Q2. 2 marks · Short answer

Distinguish between geminal and vicinal dihalides. How are these compounds named in the common and IUPAC systems?

Answer

1. Halogen positions — Geminal dihalides have both halogen atoms on the same carbon atom; vicinal dihalides have halogen atoms on adjacent carbon atoms.
2. Naming — In the common name system, geminal dihalides are alkylidene halides and vicinal dihalides are alkylene dihalides; in the IUPAC system, both are named as dihaloalkanes.

Q3. 3 marks · Medium answer

For each of the following, state whether it is a vinylic halide or an aryl halide, and identify the type of carbon to which the halogen is bonded: (i) CH_2=CHCl (ii) C_6H_5Cl.

Answer

1. CH_2=CHCl is a vinylic halide: chlorine is bonded to an sp^2-hybridised carbon of the C=C bond. The carbon bearing chlorine is part of the carbon–carbon double bond.
2. C_6H_5Cl is an aryl halide: chlorine is directly bonded to an sp^2-hybridised carbon of the aromatic ring. The bonded carbon belongs to the aromatic ring.

Q4. 5 marks · Long answer

Describe how chlorobenzene and bromobenzene can be prepared from benzene diazonium chloride. Write the reaction equations and name the reagents used.

Answer

Chlorobenzene and bromobenzene are prepared from benzene diazonium chloride by replacing its diazonium group with chlorine or bromine, respectively.

1. Benzene diazonium chloride is prepared by treating a primary aromatic amine with sodium nitrite in cold aqueous mineral acid.

2. Mixing freshly prepared benzene diazonium chloride with cuprous chloride replaces the diazonium group with chlorine. $C_6H_5N_2Cl(aq) \rightarrow (CuCl)\ C_6H_5Cl(l) + N_2(g)$.

3. Mixing freshly prepared benzene diazonium chloride with cuprous bromide replaces the diazonium group with bromine. $C_6H_5N_2Cl(aq) + CuBr(aq) \rightarrow C_6H_5Br(l) + N_2(g) + CuCl(aq)$.

4. Nitrogen gas is liberated in both reactions, and the products are chlorobenzene and bromobenzene, respectively.

These replacements are examples of Sandmeyer's reaction, used to prepare aryl chlorides and bromides from diazonium salts.

Q5. 1 mark · Multiple choice

Which statement best describes an SN2 substitution?
(A) It occurs in two steps through a carbocation intermediate.
(B) It is a concerted, single-step process in which bond formation and leaving-group departure occur together.
(C) It occurs only after the leaving group has departed in a slow step.
(D) It involves no bond formation with the incoming nucleophile.

Answer

(B) It is a concerted, single-step process in which bond formation and leaving-group departure occur together — both processes take place simultaneously, and no intermediate is formed.

Q6. 2 marks · Short answer

Classify the carbon atom bearing halogen in $CH_3CH_2CH(Br)CH_3$ as primary, secondary or tertiary. State the rule used to make the classification.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/haloalkanes-and-haloarenes

Q7. 3 marks · Multiple choice

Which statement correctly compares the common and IUPAC naming of alkyl halides?
(A) The common name gives the alkyl group followed by the halide name; the IUPAC name treats the compound as a halosubstituted hydrocarbon.
(B) Both systems name the halogen first and then the alkyl group.
(C) The common name uses hydrocarbon locants, while the IUPAC name uses only the halide name.
(D) The common name and IUPAC name are always identical.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/haloalkanes-and-haloarenes

Q8. 5 marks · Long answer

Explain the preparation of chlorobenzene and bromobenzene from benzene by electrophilic substitution. Write the equations and specify the catalysts required.

Full answer on SmartKalike: https://smartkalike.com/cbse/class-12/chemistry/haloalkanes-and-haloarenes

Q9. 1 mark · Very short answer

What stereochemical change occurs at the attacked carbon during an SN2 reaction?

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Q10. 2 marks · Short answer

State the order of reactivity of primary, secondary and tertiary alcohols with a given haloacid. Which alcohols require $ZnCl_2$ when reacted with HCl?

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