Class 12 Chemistry · Chapter 6: Haloalkanes and Haloarenes

Worksheet · 20 marks · about 40 minutes · based on NCERT

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1. Butan-1-ol is converted to 1-chlorobutane by thionyl chloride. The method is preferred because the by-products are [1]

(a) H_3PO_3 and HCl
(b) $POCl_3$ and HCl
(c) SO_2 and HCl, both gases
(d) H_2O alone

2. How many structurally different monochloro products can form when 2,3-dimethylbutane, $(CH_3)_2CH–CH(CH_3)_2$, undergoes free radical chlorination? [1]

(a) 1
(b) 2
(c) 3
(d) 4

3. 1-Methylcyclohexene reacts with HCl. The main product is [1]

(a) 1-chloro-1-methylcyclohexane
(b) 1-chloro-2-methylcyclohexane
(c) chloromethylcyclohexane
(d) 1,2-dichloro-1-methylcyclohexane

4. $CH_3CH_2CH_2CHCl_2$ is best described as [1]

(a) a vic-dihalide, 1,2-dichlorobutane
(b) a gem-dihalide, 1,1-dichlorobutane
(c) a gem-dihalide, 2,2-dichlorobutane
(d) a vic-dihalide, 1,1-dichlorobutane

5. The halide $(CH_3CH_2)_3C–Cl$ is classified as [1]

(a) a primary alkyl halide
(b) a secondary alkyl halide
(c) a tertiary alkyl halide
(d) a vinylic halide

6. How would you convert 4-chloroaniline into 1-bromo-4-chlorobenzene? Write the reagents and conditions for each step. [2]

7. Write the structures of the alkenes formed when 2-bromo-2,3-dimethylbutane, $(CH_3)_2CBr–CH(CH_3)_2$, is heated with alcoholic KOH, and say which is the major product. [2]

8. Identify the asymmetric carbon in 3-bromohexane, $CH_3CH_2CHBrCH_2CH_2CH_3$. Name two physical properties its two enantiomers share and the one property in which they differ. [2]

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9. Show how you would carry out: (i) propan-2-ol to 2-bromopropane, (ii) 2-bromopropane to 2-iodopropane, (iii) 2-iodopropane to propene. Give reagents and conditions. [3]

10. 2-Bromo-2-methylbutane is hydrolysed in water. Write the mechanism in two numbered steps with equations, the rate expression, and one reason why the reaction is fast. [3]

11. An optically active compound X, C_4H_9Cl, gives mainly Y, C_4H_8, when heated with alcoholic KOH. X with magnesium in dry ether, followed by water, gives butane. Identify X and Y, give the minor alkene, and explain why X is optically active. [3]