

Alkanes

1. *Pristane* is an alkane that is present to the extent of about 14% in shark liver oil. Its IUPAC name is 2,6,10,14-tetramethylpentadecane. Write its structural formula.
2. Mixture of bromoethane and 2-bromopropane was heated with sodium metal. Write the reaction scheme showing all possible products.
3. How to prepare isobutane and 2,5-dimethylhexane starting from 3-methylbutanoic acid and any inorganic reagents?
4. Diethylithiumcuprate $\text{LiCu}(\text{C}_2\text{H}_5)_2$ and alkyl iodide were used for the preparation of 2-methylpentane. What alkyl iodide was used for the reaction? Write reaction schemes for the synthesis of Diethylithiumcuprate and its reaction with alkyl iodide.
5. Hydrocarbon C_6H_{14} can be prepared by Wurtz reaction as a single product. Monobromination of this hydrocarbon leads to one tertiary bromoderivative $\text{C}_6\text{H}_{13}\text{Br}$.
6. What hydrocarbon forms from tert-butylacetic acid upon the electrolysis of its sodium salt? Propose a reaction mechanism.
7. Write the scheme of reaction between 2-methylpropane and chlorine gas under UV irradiation. Propose a reaction mechanism.
8. Photochemical chlorination of isopentane lead to the formation of a mixture of monochloroderivatives:
2-methyl-1-chlorobutane – 30 %
3-methyl-1-chlorobutane – 15 %
3-methyl-2-chlorobutane – 33 %
2-methyl-2-chlorobutane – 22 %
Compare the relative reactivity of hydrogen atoms connected to primary, secondary and tertiary carbon atoms in chlorination reaction.