



CHEMISTRY

JEE (MAIN AND ADVANCED)

CHEMISTRY

SATURATED HYDROCARBONS

Problem

1. Predict the alkanes that are formed when ethyl bromide and n - propyl bromide react

with sodium in dry ether solvent.



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2. Sodium salt of which fatty acid is needed to prepare butane ? Give the equation.



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3. Which alkane can be obtained by the electrolysis of the aqueous solution of sodium propanoate ?



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4. Predict the alkane formed when C_2H_5OH is treated with methyl magnesium halide. Write the equation.



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5. Arrange n-hexane, 3-methyl pentane and 2,2-dimethyl butane in the increasing order of their boiling points and discuss.



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6. Why do the C-C bonds rather than the C-H bonds break during pyrolysis of alkanes ?



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7. What hydrocarbon is formed as byproduct during the chlorination of methane ? Explain.



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8. Draw Newman projection formulae staggered forms of butane and compare their stability.



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Exercise 3 1 1

1. Why alkanes are known as paraffins ?



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2. Write any four methods of preparation of methane ? How does it react with chlorine ?



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3. Describe any four methods of preparation of ethane ? Explain the mechanism of chlorination of ethane.



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4. Explain Wurtz reaction with one example.



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5. What is Kolbe's electrolysis ? How ethane can be obtained by this method ?



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6. Methyl magnesium bromide is treated with ethanol, what is the formula of the alkane

formed ?



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7. What is pyrolysis? Give one example.



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8. Explain the variation of melting points and boiling points with increase in molecular mass of alkanes.



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9. What are the oxidation products of methane in presence of catalysts, copper and oxide of molybdenum ?



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10. Characteristic reactions of alkanes are substitution reactions. Explain.



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11. Write the uses of methane and ethane.



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12. Write a brief note on the conformational isomerism.



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13. Write the Newman projections of ethane.

Which form is most stable ? Why ?



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14. Explain newman projections of n-butane and their relative stabilities.



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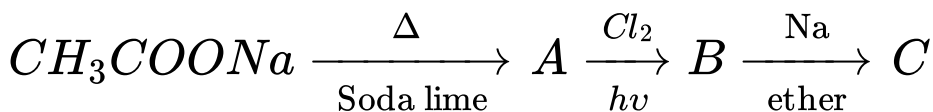
Questions For Descriptive Answers

1. Why boiling and melting points of hydrocarbons are low ?



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2. Write the organic substances A, B and C in the reaction given below.



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3. Why is Wurtz reaction not preferred for the preparation of alkanes containing odd number of carbon atoms ? Illustrate with one example.



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4. The boiling points of branched chain alkanes are lower than their normal chains.

Why ?



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5. Which compounds give ethane on (a) decarboxylation and (b) electrolysis ?



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6. How do you account for the formation of ethane during chlorination of methane?



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7. How the heat of combustion of alkanes changes with branching ? Explain stability of alkanes from this.



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8. The fully eclipsed conformation of n-butane is least stable due to the presence of



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9. The major product obtained in the photo-catalysed bromination of 2-methylbutane is



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10. Cyclobutane is more reactive than cyclopentane. Why ?



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