

Activity 18: Alkane Nomenclature

Learning Objectives

Provide IUPAC names for alkanes, haloalkanes, and cycloalkanes with two substituents

Estimated Completion Time 90 Minutes

Instructor Information

This activity may require some discussion between instructor and students, as students have difficulty reading all the given information without getting sidetracked. Questions 1, 2, and part of 3 can be done as a class as a way of introducing alkane nomenclature. Be sure to emphasize in question 2 that both molecules are 2-methylbutane. This is a difficult concept for students.

ANSWERS TO QUESTIONS

1.

Methyl	Ethyl	Propyl	Isopropyl
$-\text{CH}_3$	$-\text{CH}_2\text{CH}_3$	$-\text{CH}_2\text{CH}_2\text{CH}_3$	$\begin{array}{c} \text{CH}_3\text{CHCH}_3 \\ \end{array}$

2. Both molecules are 2-methylbutane.

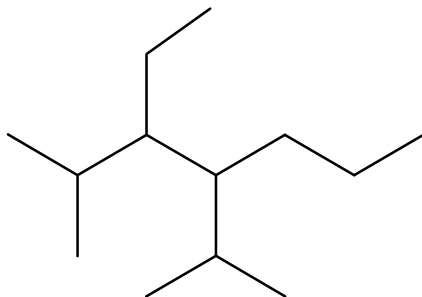
3. a. 4-methylheptane b. 5-ethyl-2-methyloctane
c. 4-isopropylheptane d. 4-ethyl-2-methylheptane
4. a. 2-bromo-4-ethyl-8-methylnonane
b. 2-chloro-5-methylheptane

5. Cyclobutane, cyclopentane, cycloheptane

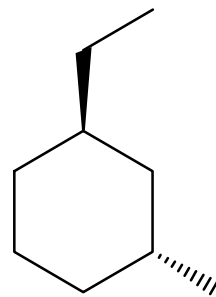
Methylcyclopentane, bromocyclohexane, *trans*-1-chloro-2-methylcyclopentane

6.

a.



b.



Activity 18: Skill Development

1. a. 3-bromo-4-methylhexane

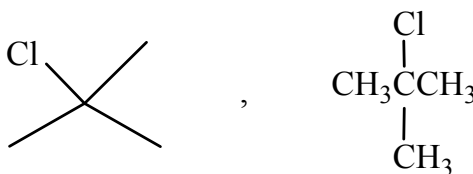
b. 4-isopropyl-5,6-dimethylnonane

c. *cis*-1-bromo-4-propylcyclohexane

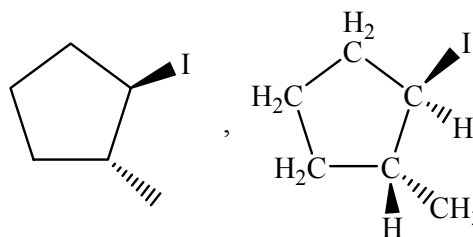
d. 2-chloro-4-ethyl-6-methylheptane

2.

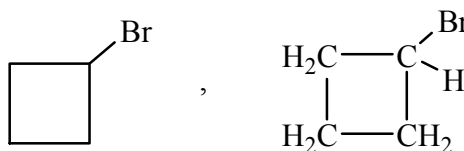
a.



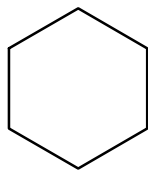
b.



c.

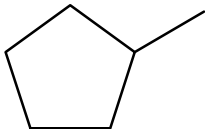


3. Some possibilities are shown below:

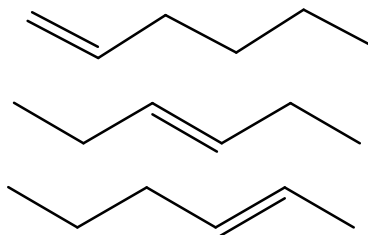


Cyclohexane

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methylcyclopentane

1-hexene, 3-hexene, and 2-hexene