

1.2: Constitutional Isomers

Learning Objective

- Introduction to constitutional isomers using alkanes

Evaluate the two molecules below (Figure 1.2.1).

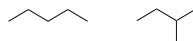


Figure 1.2.1. Two alkanes for comparison

- How are they the same?
- How are they different?

Two molecules which have the same molecular formula but different structural formulas, or bonding arrangements, are known as **constitutional isomers**.

Pentane is an alkane with five carbon atoms. It has three constitutional isomers, shown below.

Figure 1.2.2. Unbranched isomer of pentane



Figure 1.2.3. Branched constitutional isomer of pentane



Figure 1.2.4. Branched constitutional isomer of pentane



Practice Questions

1. Draw three constitutional isomers of heptane.
2. Circle the constitutional isomers of hexane in the figure below. Why are the remaining molecules not considered to be constitutional isomers of hexane?

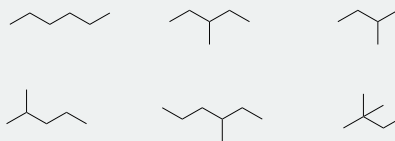


Figure 1.2.5

3. Draw the constitutional isomer of hexane that is missing.
4. What is the minimum number of carbons in the chain of an alkane to be able to have a constitutional isomer?

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