

Section 11.1 Questions

Understanding Concepts

- Classify each of the following compounds as inorganic or organic:
 - $\text{CaCO}_3(\text{s})$
 - $\text{C}_6\text{H}_6(\text{l})$
 - $\text{CO}_2(\text{g})$
 - $\text{C}_4\text{H}_{10}(\text{g})$
 - $\text{CH}_3(\text{CH}_2)_6\text{CH}_3(\text{l})$
- What is believed to be the origin of most hydrocarbons on Earth?
- Identify the sources of most organic compounds.
- List three common fuels that are hydrocarbon compounds.
- Draw a complete structural diagram to explain each of the following empirical formulas:
 - $\text{C}_3\text{H}_8(\text{g})$
 - $\text{C}_5\text{H}_{12}(\text{l})$
 - $\text{C}_7\text{H}_{16}(\text{l})$
- Name the following hydrocarbons, which are found in a sample of crude oil:
 - $\text{C}_2\text{H}_6(\text{g})$
 - $\text{C}_4\text{H}_{10}(\text{g})$
 - $\text{C}_6\text{H}_{14}(\text{l})$
 - $\text{C}_9\text{H}_{20}(\text{l})$
- Can the hydrocarbon $\text{C}_{45}\text{H}_{92}(\text{s})$ be classified as an alkane? Justify your answer.

Applying Inquiry Skills

- Complete the Analysis section of the following lab report.

Question

What is the chemical formula, molecular structure, and name of an unknown gas?

Experimental Design

A sample of a gas is analyzed with a combustion analyzer and a mass spectrometer.

Evidence

percent by mass of carbon = 81.68%

percent by mass of hydrogen = 18.32%

molar mass by analysis = 44.01 g/mol

Analysis

- Determine the empirical molecular formula of the hydrocarbon, name it, and draw a structural diagram.

Making Connections

- Are fossil fuels a finite source of hydrocarbons? Provide your reasoning.

Reflecting

- What will we use for an energy source and raw material for making plastics, fabric, detergents, and so on if sources of fossil fuels are depleted?