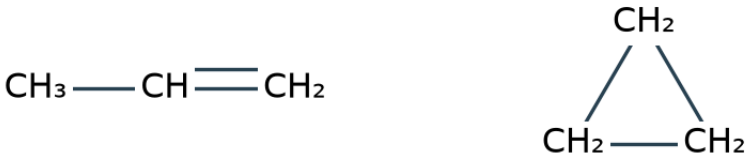
Checking Two Models of a Three-Carbon Gas

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A lab display compares two model molecules for a gas. Each drawing groups a carbon atom with the hydrogen atoms attached to it. Lines between groups show bonds between the carbon atoms. Two lines represent a double bond.

Model A **Model B**



Two arrangements of carbon atoms and attached hydrogen atoms.

1 Write the molecular formula for each drawing. Show how you determined the hydrogen counts. [1]

Answer and work

2 Which statement correctly compares the carbon bonds in the models?

(1) Both models contain a ring.

(2) Only Model A contains a ring.

(3) Model A has a carbon double bond, and Model B has a ring of single bonds.

(4) Both models have an open chain containing a carbon double bond.

The gas has a measured molecular mass of about 42 u. A separate measurement indicates that two carbon atoms in each molecule share a double bond. Assume one of the two drawings represents the gas.

3 Which measurement distinguishes the models, and which model fits it? Explain why the other measurement cannot make that distinction. [1]

Answer and work

4 A student says the rightmost carbon in A has only three bonds because it is attached to three atoms. Explain how the drawing can be consistent with four shared electron pairs around that carbon. [1]

Answer and work