VSEPR rules can be applied to other structures

- molecules without a single central atom (organic molecules)
- molecules with multiple bonds
Structure of alkanes

Lewis Structures

H
H C H
H

H
H C C H
H H

H
H C C C H
H H H

H
H C C C C C H
H H H H H

All C atoms have 4 bonded pairs no lone pairs

EPG:

MG:

Bond angle =
ALKENES

Contain one or more double bonds

ethene

\[
\begin{array}{cc}
\text{H} & \text{C}==\text{C} \\
\text{H} & \text{H} \\
\text{H} & \text{H} \\
\end{array}
\]

propene

\[
\begin{array}{cc}
\text{H} & \text{C}==\text{C} \\
\text{H} & \text{CH}_3 \\
\end{array}
\]

The carbons on either side of the double bond have three electron domains.

EPG:

MG:

C=C—H or C=C—C Bond angle
ALKYNES
contain one or more triple bonds

\[ \text{H} \equiv \text{C} \equiv \text{C} \equiv \text{H} \]

ethylne

\[ \text{CH}_3 \equiv \text{C} \equiv \text{C} \equiv \text{H} \]

propyne

Each C has two electron domains.

EPG

MG:

bond angle
Determine the approximate bond angles indicated

<table>
<thead>
<tr>
<th>Angle #1</th>
<th>Angle #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 109°</td>
<td>109°</td>
</tr>
<tr>
<td>2. 180°</td>
<td>120°</td>
</tr>
<tr>
<td>3. 120°</td>
<td>90°</td>
</tr>
<tr>
<td>4. 109°</td>
<td>120°</td>
</tr>
<tr>
<td>5. 120°</td>
<td>109°</td>
</tr>
</tbody>
</table>