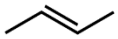
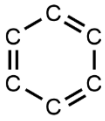
**CONCEPT:** INTRO TO HYDROCARBONS

- **Recall**: hydrocarbons are the simplest organic compounds composed solely of _____and _____.

**Hydrocarbons**

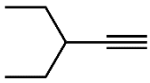
| Class | Bond Type | Example | Hybridization | Generic Formula* |
|---|---|---|---|---|
| Alkanes | C—C |  | $sp^3$ | _____ |
| Alkenes | C=C |  | _____ | $C_nH_{2n}$ |
| Alkynes | C≡C |  | sp | _____ |
| Cycloalkanes | C—C |  | _____ | _____ |
| Aromatics |  |  | _____ | $C_nH_n$ |

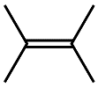
* n = # of C atoms

**EXAMPLE**: Classify each of the following hydrocarbons as an alkane, alkene, or alkyne.

a) 

b) 

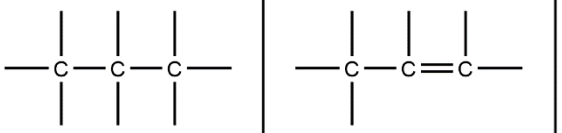
c) 

d) 

**Saturated and Unsaturated Hydrocarbons**

- **Saturated**: All _____ bonds; each C has max possible H atoms.
- **Unsaturated**: At least on _____ or _____ bond; does not have max H atoms.

**Saturated vs Unsaturated**

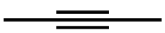


**EXAMPLE**: Classify the following hydrocarbons as saturated or unsaturated:

a) 

b) 

c) 

d) 

**CONCEPT:** INTRO TO HYDROCARBONS

**PRACTICE**: Write the molecular formula for an alkane with 5 C atoms.

**PRACTICE**: Write the molecular formula for an alkyne with 4 C atoms.

**PRACTICE**: Which of the following molecular formulas might indicate an alkene?

a) $C_7H_{16}$

b) $C_6H_{12}$

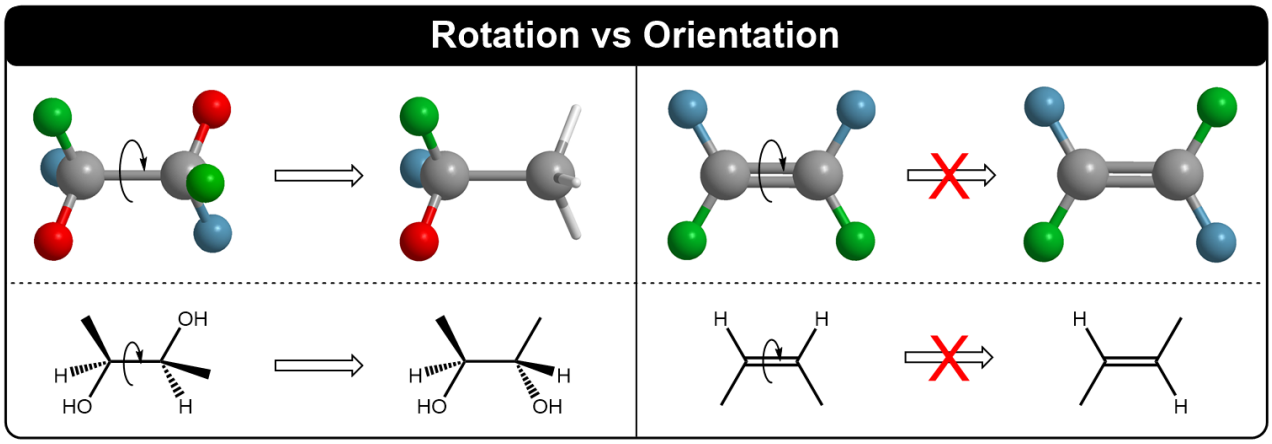
c) $C_5H_8$

d) $C_4H_{10}$

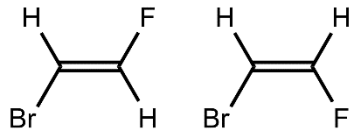
**CONCEPT:** INTRO TO HYDROCARBONS

**Bond Rotation and Spatial Orientation**

- The C–C bonds in alkanes can _____ freely.
- The C____C bond in alkenes cannot rotate.
  - This leads to two different spatial orientations and two _____ compounds.




**EXAMPLE**: Determine if the two structures below are the same or different compounds.




a) Same compound

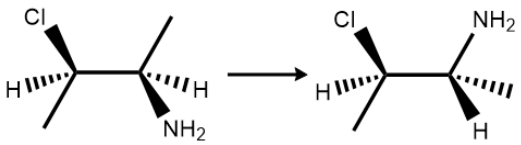
b) Different compounds

**PRACTICE**: Which of the following is not a valid bond rotation?

a)

b)

c)




d)