

## E, Z Isomerism Illustrated With Models

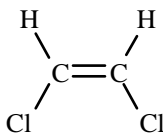
Name \_\_\_\_\_

### Lab 8 Pre-Lab Activity

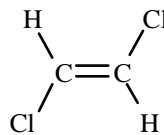
Section \_\_\_\_\_

Date \_\_\_\_\_

Procedure: Construct a model of 1,2-dichloroethene so that if viewed from above and in front, it would appear as shown in A. In a similar manner, construct B.



A



B

- Are the models superimposable? Yes No
- Are A and B constitutional isomers? Yes No
- Are A and B Stereoisomers? Yes No
- Stereoisomers are classified as mirror image (called enantiomers) or not mirror image (called diastereomers). Are A and B mirror image or not mirror image? Circle your answer.

mirror images

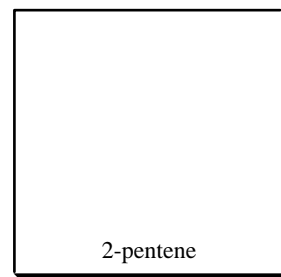
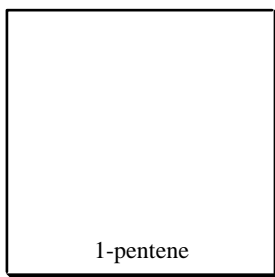
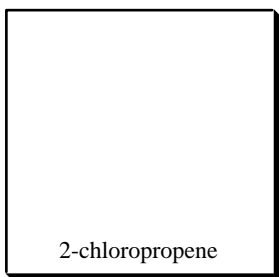
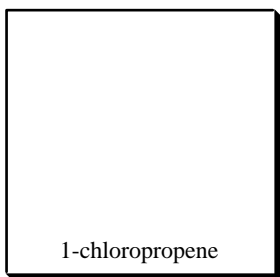
not mirror images

- Name compound A. \_\_\_\_\_
- Name compound B. \_\_\_\_\_
- Without breaking bonds, can A and B be interconverted? Yes No

Replace one chlorine atom with a hydrogen atom in each of your models.

- Are the models superimposable now? Yes No
- Name either molecule. \_\_\_\_\_
- What structural feature is necessary if an alkene is to exist in E and Z forms? Circle your answer.
  - all double bonds can show cis and trans isomers
  - one of the carbons of the double bond must have two different groups
  - both carbons of the double bond must have two different groups

- Draw the indicated compounds in the boxes. Circle any compound that can exist as E and Z isomers.



Lab. 8 Data Sheet

**Reaction:**

Name \_\_\_\_\_

Section \_\_\_\_\_

Date \_\_\_\_\_

**Moles** of starting cyclohexanol \_\_\_\_\_

**Moles** of cyclohexene expected \_\_\_\_\_

**Theoretical yield** of cyclohexene (in grams) \_\_\_\_\_

**Corrected boiling point range** of cyclohexene produced \_\_\_\_\_

**Corrected refractive Index** of cyclohexene produced \_\_\_\_\_

**Mass** of cyclohexene produced \_\_\_\_\_

**Percent yield** of cyclohexene  
(nearest whole number) \_\_\_\_\_

**Calculations for the theoretical yield:**

**Calculations for the percent yield:**

$$\% \text{Yield} = \frac{\text{actual}}{\text{theoretical}} \times 100\% =$$

<b>Tests for alkenes:</b>	cyclohexane		cyclohexene	
Bromine in nonaqueous solution	+	-	+	-
Acid permanganate test	+	-	+	-
Sulfuric acid	+	-	+	-

**Questions**

The reaction of cyclohexene with cold dilute aqueous potassium permanganate (KMnO<sub>4</sub>) gives a compound having the empirical formula C<sub>6</sub>H<sub>12</sub>O<sub>2</sub>. What is the structure of this compound and what is the stereochemistry?

The reaction of cyclohexene with bromine (Br<sub>2</sub>) gives a compound having the empirical formula C<sub>6</sub>H<sub>10</sub>Br<sub>2</sub>. What is the structure of this compound and what is the stereochemistry?