**Name**
**Date** **Period**

**Grade:**

# EXPERIMENT 43
# ORGANIC MODEL EXERCISE

**PRELAB QUESTIONS:**
Terms to Define: organic chemistry, saturated hydrocarbons, unsaturated hydrocarbons, functional group, IUPAC nomenclature, halogen, carbonyl group, molecular formula, structural formula, isomer.

NAME _____ PERIOD_____

DATE_____ LAB PARTNERS _____

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# EXPERIMENT 40
# ORGANIC MODEL EXERCISE

## 1. Functional Group Exercise

**DIRECTIONS**: For each molecular formula below, name the molecule. Then draw the structural formula by using the appropriate symbol (C, H, O, Cl) for each atom and represent the bonds with straight lines. Once you have determined what the molecule will look like as a structural formula, construct the molecular model. For single bonds use wooden pegs. For double and triple bonds use two of three springs.

**1. alkane**

a. $CH_4$ _____ b. $C_2H_6$ _____ c. $C_3H_8$_____

**2. alkene**

a. $C_2H_4$ _____ b. $C_3H_6$ _____

**3. alkyne**

a. $C_2H_2$ _____ b. $C_3H_4$ _____

**4. organic halogen**

a. $CH_3Cl$ _____ b. $CCl_4$ _____

**5. alcohol**

a. $CH_3OH$ _____ b. $C_2H_5OH$ _____

**6. ether**

a. $CH_3OCH_3$ dimethyl ether b. $CH_3OC_2H_5$ methyl ethyl ether

**7. aldehyde**

a. HCHO methanal b. $CH_3CHO$ ethanal

**8. ketone**

a. $CH_3COCH_3$ propanone b. $CH_3CH_2COCH_3$ butanone

**9. carboxylic acid**

a. HCOOH methanoic acid b. $CH_3COOH$ ethanoic acid

**10. ester**

a. $HCOOCH_3$ methyl methanoate

b. $CH_3COOC_2H_5$ ethyl ethanoate

## II. Isomer Exercise

**DIRECTIONS**: For each formula draw the structural formula for all the possible isomers. Use the structural formula as a guide in constructing the ball and stick model of each isomer.

**1. $C_4H_{10}$**

Hint: Make two isomers that are both alkanes.

**2. $C_5H_{12}$**

Hint: Make three isomers that are all alkanes.

**3. $CH_2Cl_2$**

Hint: Only one organic halogen is possible.

**4. $C_3H_7Br$**

Hint: Make two isomers that are both organic halogens.

**5. $C_3H_6I_2$**

Hint: Make four isomers that are all organic halogens.

**6. $C_2H_6O$**

Hint: Make two isomers, one an alcohol and the other an ether.

**7. $C_3H_6O$**

Hint: Make two isomers, one an aldehyde and the other a ketone.

**8. $C_3H_8O$**

Hint: Make three isomers, two are alcohols and one is an ether.

**9. $C_4H_8O$**

Hint: Make three isomers, two are aldehydes and one is a ketone.

**10. $C_4H_{10}O$**

Hint: Make seven isomers.  Four isomers are alcohols and three are ethers.