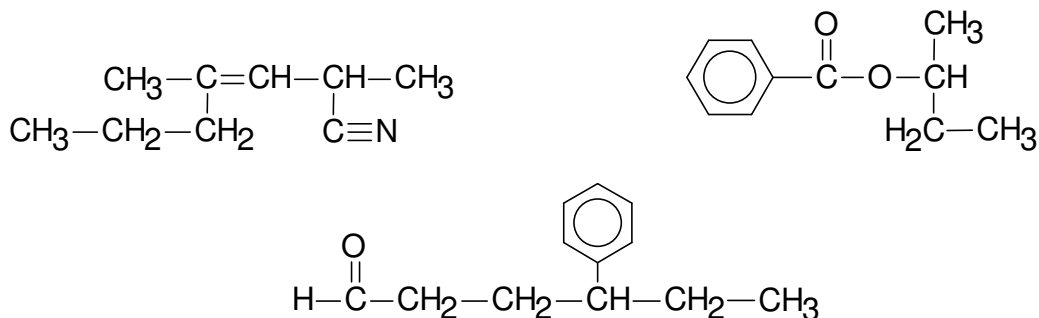


## Review Questions -- Organic and Polymer Chemistry

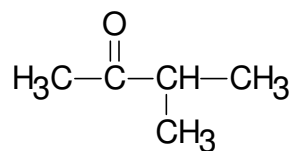
- (1) Write **complete, systematic names** for:



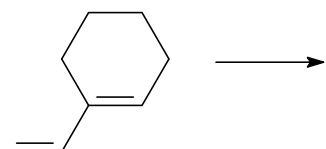
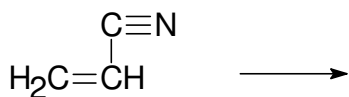
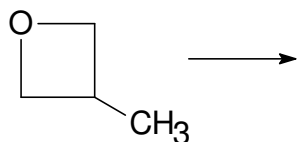
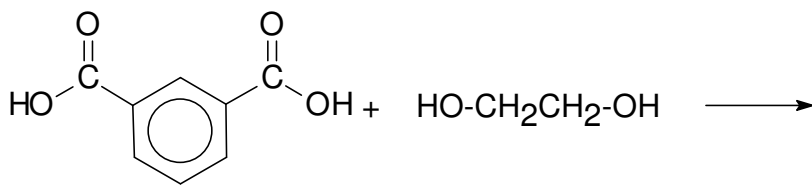
- (2) Write **complete, specific structural formulas** for all of the organic reactants and products in the reaction.



- (3) Show, **with specific structures and reactions**, how the following compound can be prepared in three steps starting with the appropriate alkyne.



- (4) Write a **complete structural formula** of the organic polymer that is produced in each reaction. State whether the polymerization process is addition, condensation, or ring-opening.



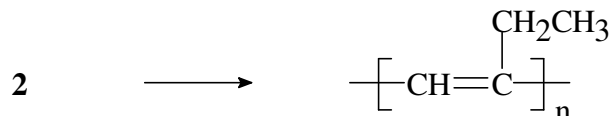
## Organic Reactions -- Review Question

There are nine **structural isomers** of the "simple" hydrocarbon formula **C<sub>4</sub>H<sub>6</sub>**. All of them contain multiple bonds and/or rings. Based on the information provided in the following questions, identify **eight specific isomers of C<sub>4</sub>H<sub>6</sub>**. Write **specific structural formulas** for compounds **1 - 9** and for all other organic compounds that are **underlined**.

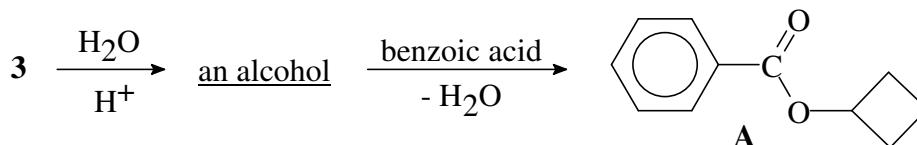
1. Compound **1** reacts with Br<sub>2</sub> to produce a dibromoalkene.



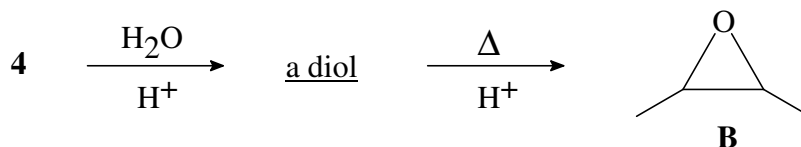
2. Compound **2** undergoes **addition polymerization** as follows.



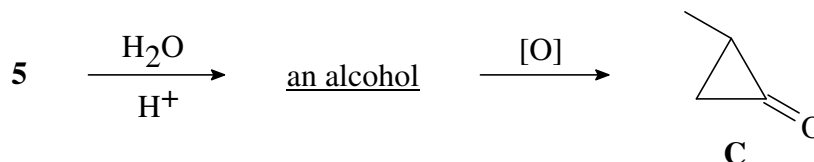
3. Compound **3** readily adds water to form an alcohol that, in turn, reacts with benzoic acid to produce ester **A**.



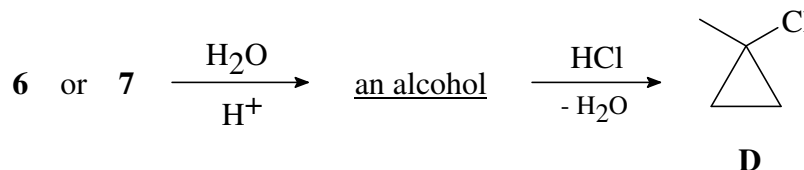
4. Compound **4** reacts with an **excess** of water to give a diol. When this diol is heated with a catalytic amount of sulfuric acid, the cyclic ether **B** is produced.



5. Compound **5** adds water to form an alcohol that, in turn, can be oxidized to produce the cyclic ketone **C**.



6. Compounds **6** and **7** both add water to yield an alcohol that undergoes substitution to yield the *cyclopropane* product **D**.



7. Compound **8** has a 4-carbon backbone in which the hybridization at the carbon atoms occurs in the following order.



8. The last isomer of C<sub>4</sub>H<sub>6</sub> (compound **9**) is.....