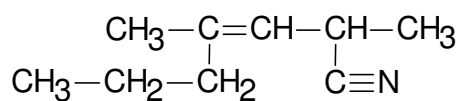
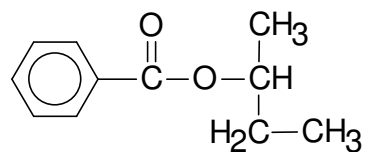


## Review Questions -- Organic and Polymer Chemistry

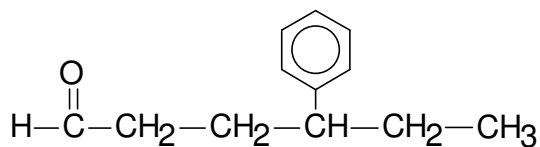
(1) Write **complete, systematic names** for:



2-cyano-4-methyl-3-heptene

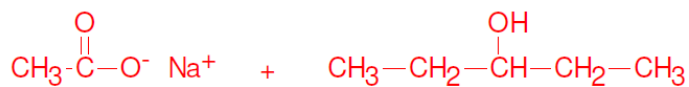
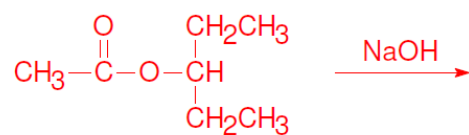


2-butyl benzoate

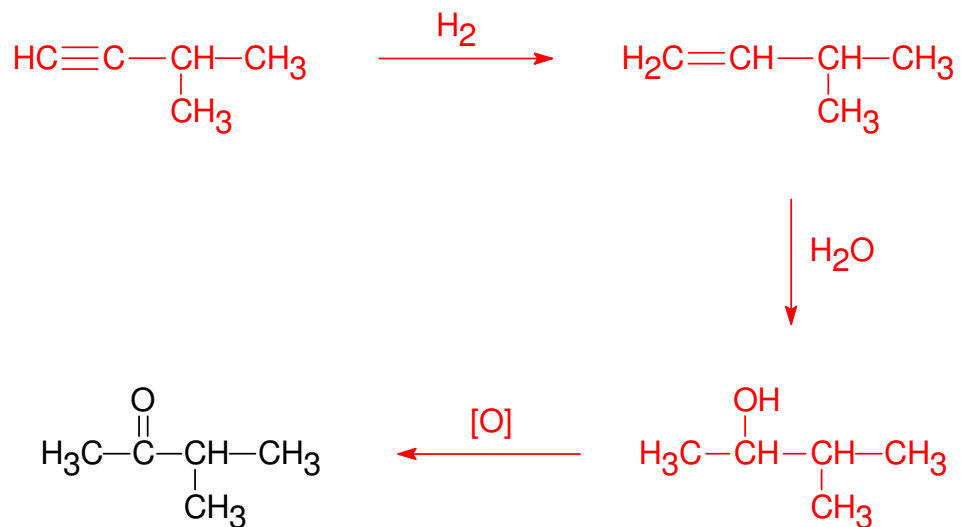


4-phenylhexanal

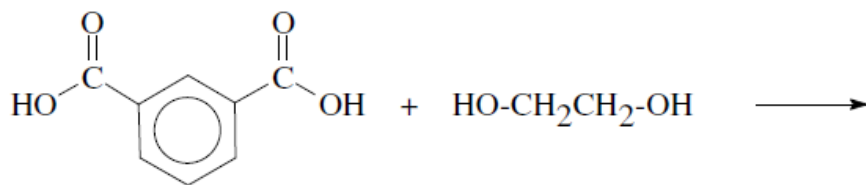
(2) Write **complete, specific structural formulas** for all of the organic reactants and products in the reaction.



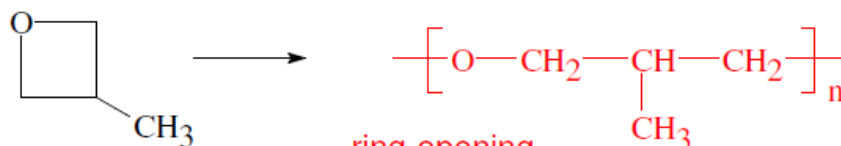
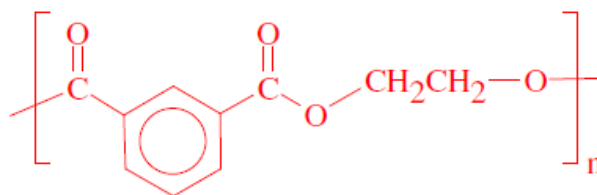
- (3) Show, **with specific structures and reactions**, how the following compound can be prepared in three steps starting with the appropriate alkyne.



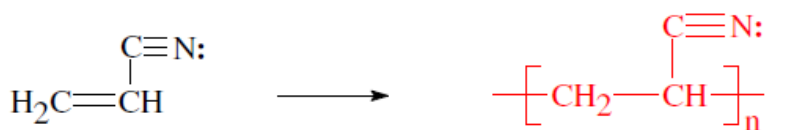
- (4) Write a **complete structural formula** of the organic polymer that is produced in each reaction. State whether the polymerization process is addition, condensation, or ring-opening.



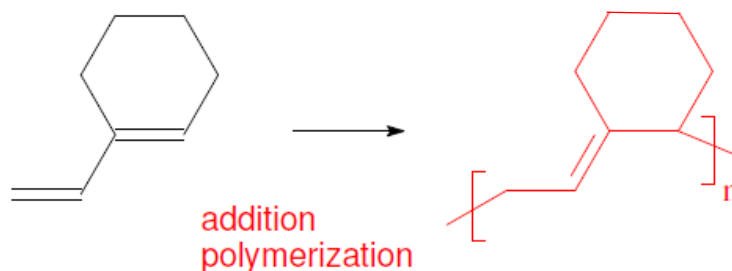
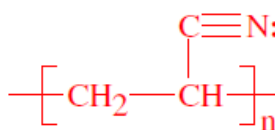
condensation  
polymerization



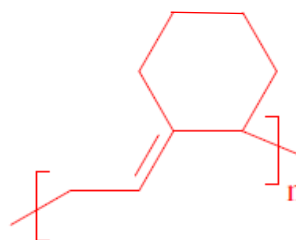
ring-opening  
polymerization



addition  
polymerization



addition  
polymerization



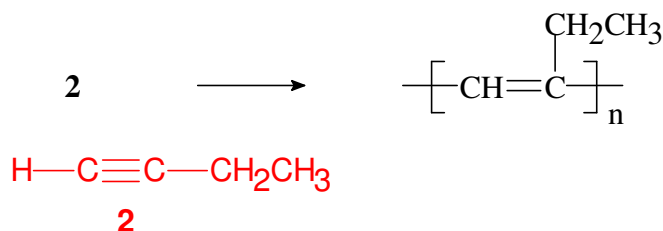
## Organic Reactions -- Review Question

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**.

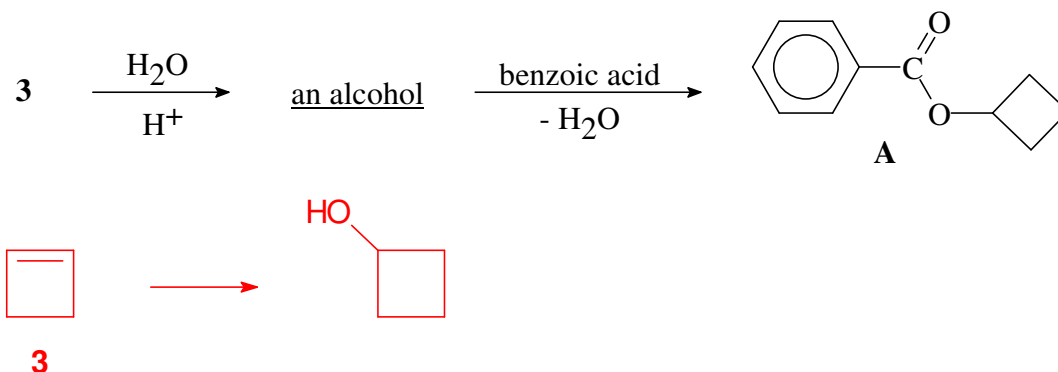
1. Compound **1** reacts with Br<sub>2</sub> to produce a dibromoalkene.



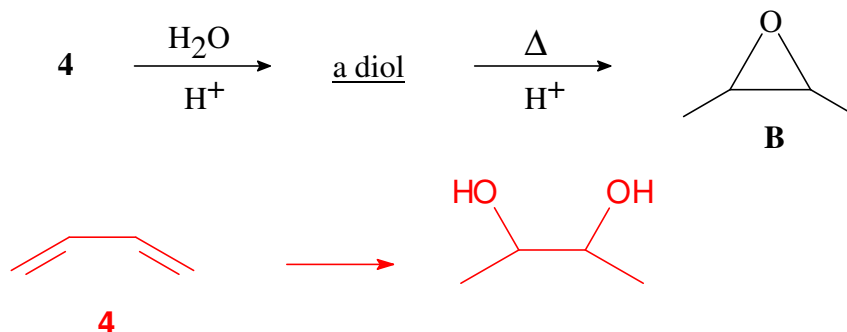
2. Compound **2** undergoes **addition polymerization** as follows.



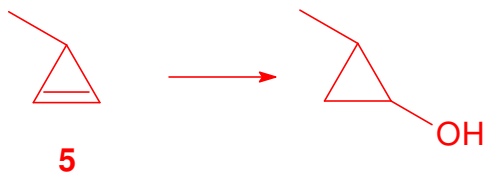
3. Compound **3** readily adds water to form an alcohol that, in turn, reacts with benzoic acid to produce ester **A**.



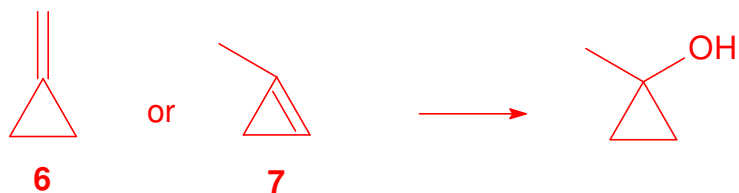
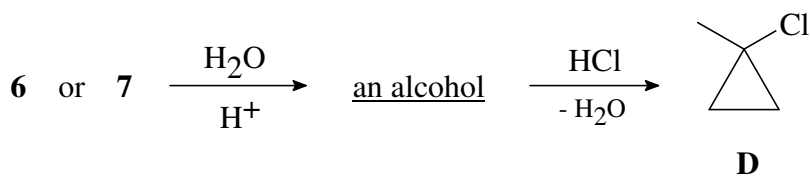
4. Compound **4** reacts with an **excess** of water to give a diol. When this diol is heated with a catalytic amount of sulfuric acid, the cyclic ether **B** is produced.



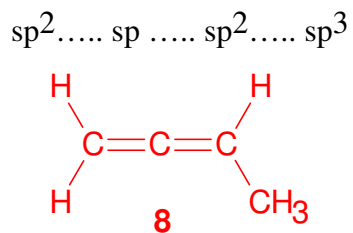
5. Compound **5** adds water to form an alcohol that, in turn, can be oxidized to produce the cyclic ketone **C**.



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



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



8. Compound **9** is.....

