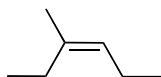


# Organic Chemistry

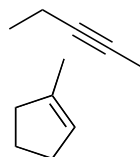
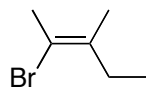
## CHM 223

### Exam 3 Study Questions

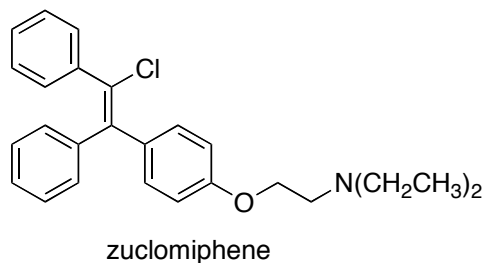
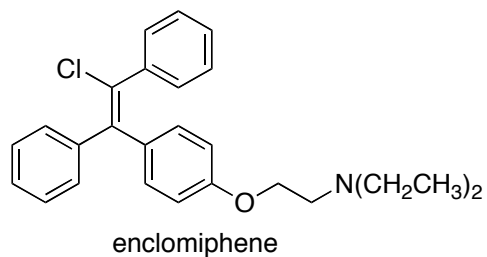
Provide the correct IUPAC name for the following molecule:



Assign appropriate IUPAC names to the following compounds. Make sure to use the correct *E/Z* assignments when assigning names, if required.



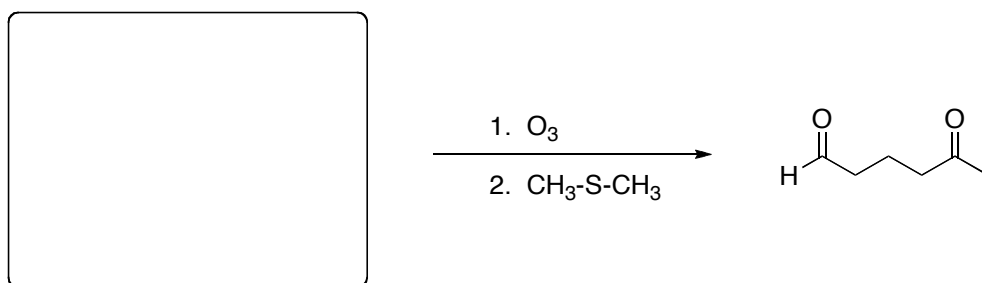
The fertility drug clomiphene (trade name Clomid) is sold as a mixture of diastereomers, enclomiphene and zuclomiphene. Designate each alkene as an *E* or *Z* isomer.



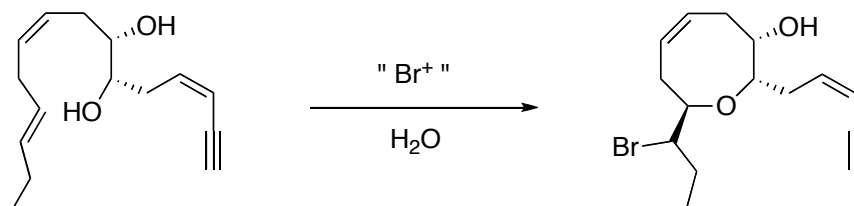
Draw the structure of (*E*)-3,6-dimethyl-3-octene

Draw an energy diagram for the two-step mechanism for the addition of  $\text{Br}_2$  to  $\text{CH}_2=\text{CH}_2$  to form 1,2-dibromoethane (assume that the reaction is exergonic). Label the starting material and product as well as any intermediates ( $\text{I}^1$ ,  $\text{I}^2$ , etc.) or transition states ( $\ddagger^1$ ,  $\ddagger^2$ , etc.).

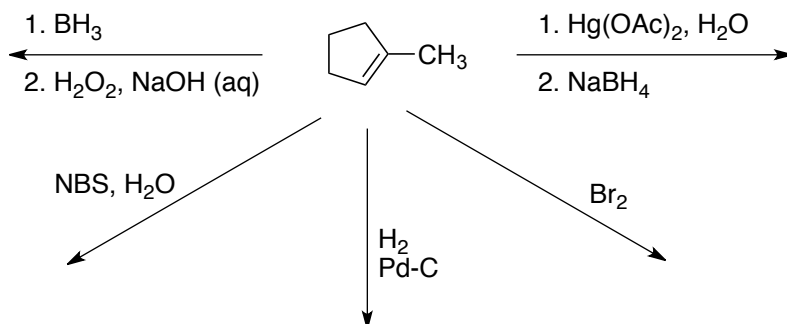
Draw the structure of the alkene that reacts with ozone followed by dimethyl sulfide to give the following product.



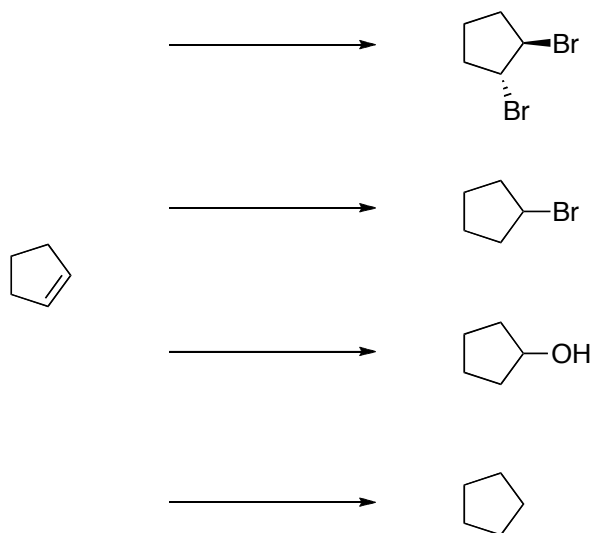
Isolated from marine algae, prelaureatin is thought to be biosynthesized from laurediol by the following route. Propose a mechanism. Hint: If you are looking for a base, assume there is LOTS of water around (since we're operating inside an organism).



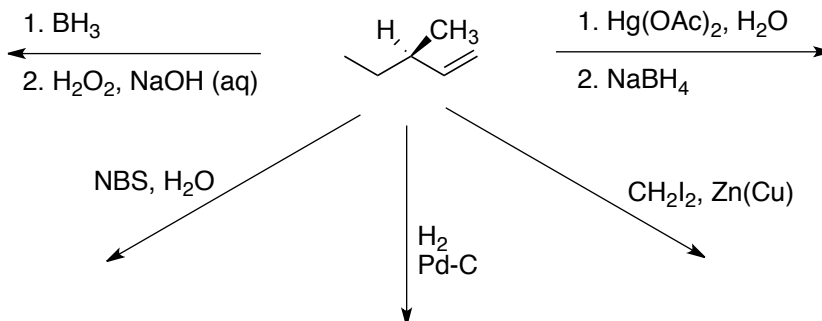
Draw the product of each reaction, below, making certain to show stereochemistry when relevant. If there are more than one product formed, are they enantiomers? diastereomers?



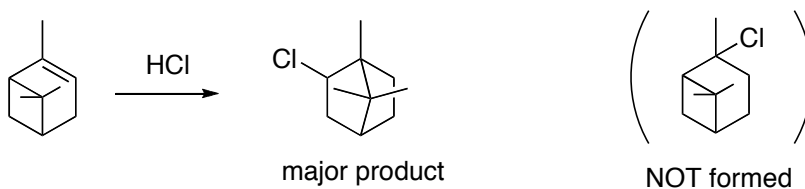
Show how to convert cyclopentene to the following 4 compounds by writing the appropriate reagent(s) at each reaction arrow. There may be more than one correct answer.



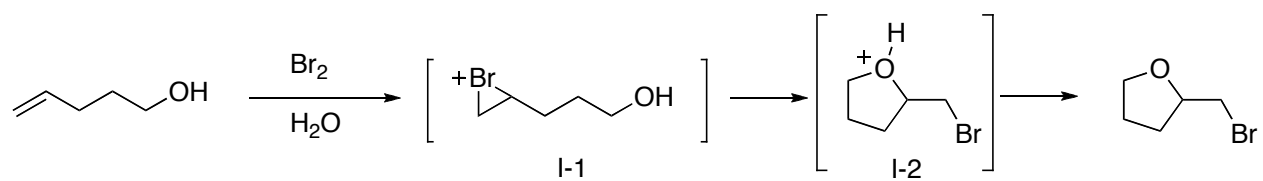
Draw the product of each reaction, below, making certain to show stereochemistry when relevant. If there are more than one product formed, are they enantiomers? diastereomers?



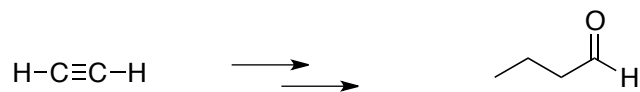
Treatment of  $\alpha$ -pinene with hydrochloric acid yields the major product shown below, NOT the direct Markovnikov addition product. Draw a stepwise, arrow pushing mechanism that supports the formation of the major product identified below.



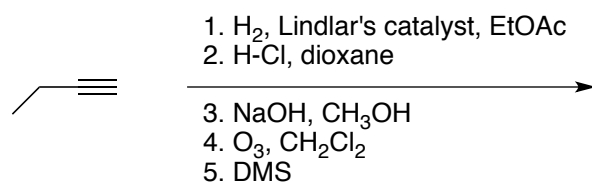
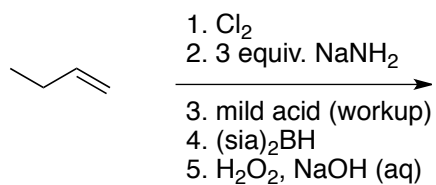
Draw an arrow-pushing mechanism that details each step of the following reaction:



Starting with acetylene, propose a synthesis of 1-butanal (provide an ordered list of reagents).



Draw the product of the following reaction sequences:



In the spaces to the right, enter the reagents necessary to accomplish the following transformations.

