How to name your molecule

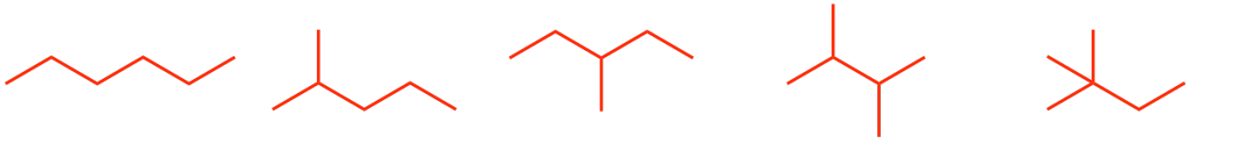
1) Identify longest carbon chain (the parent chain).
   * If multiple competing parent chains, then:
     (a) choose chain with more side chains
     (b) choose chain with substituents with lowest numbers
   * If a ring is present (cyclo-) it is usually the parent chain.
2) Identify all substituents off parent chain.
3) Number carbons of the parent chain from end that gives the substituents the lowest numbers.
   * If multiple of the same substituent, use prefixes: di-, tri-, tetra-, etc.
4) If more than one substituent, put them in alphabetical order by the root of the substituent (butyl, ethyl, methyl, etc.).

1. Determine and name the constitutional isomers for each alkane.

A) C_5H_{12}

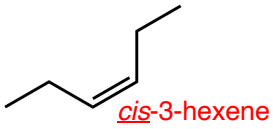
pentane 2-methylbutane 2,2-dimethylpropane

B) C_6H_{14}

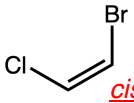


hexane 2-methylpentane 3-methylpentane 2,3-dimethylbutane 2,2-dimethylbutane

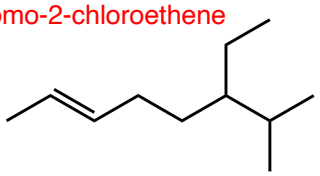
2. Identify the molecules that exhibit geometric isomerism. Then label each as cis (Z) or trans (E). For extra practice, name each of the molecules.



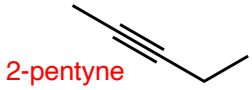
cis-3-hexene



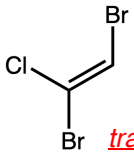
cis-1-bromo-2-chloroethene



trans-6-ethyl-7-methyl-2-octene



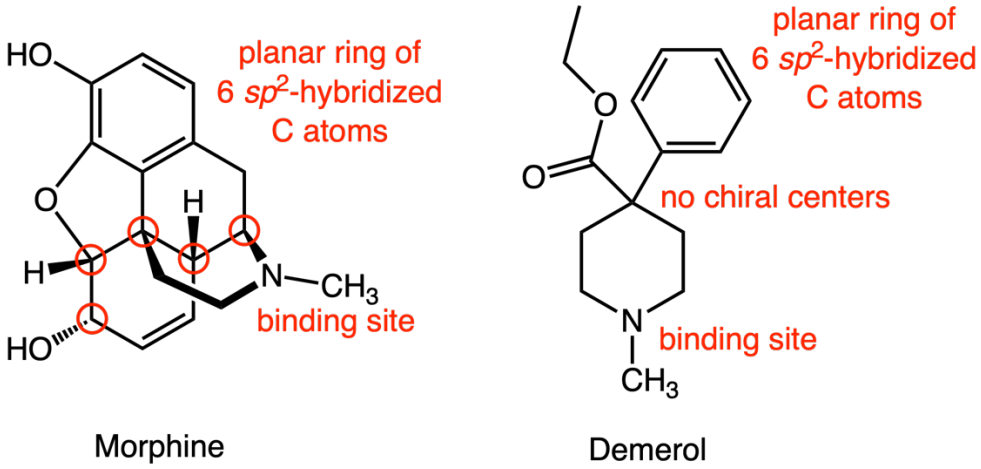
2-pentyne



trans-1,2-dibromo-1-chloroethene

3. Which of the following molecules are chiral (exhibit optical isomerism)? Circle the chiral centers.

4. Given below are two pain medications: morphine and Demerol.



A) Circle all the chiral centers in morphine.

B) Both morphine and Demerol interact with receptors similarly because they share similar structural features. In particular, one portion of both molecules is flat/planar and another portion of both molecules binds to the receptor site.

Identify the two portions of the molecules described above for both morphine and Demerol.