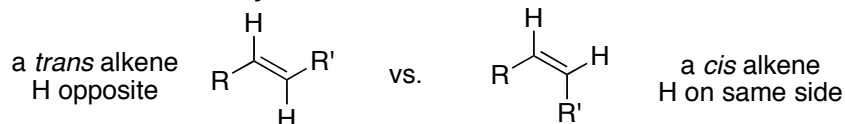


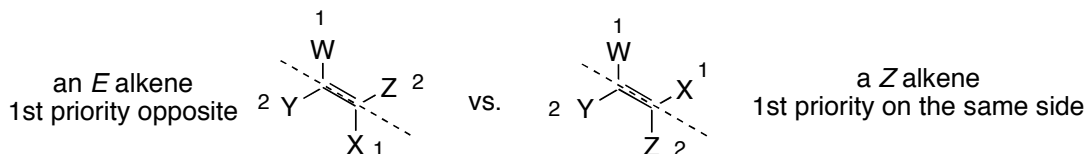
## Assigning Stereochemistry VI

### *E* and *Z* in Alkenes

- Alkenes can have multiple geometric isomers (non-superimposable, non-mirror images)
- If there are exactly two substituents and two hydrogens attached an alkene the isomer may be labeled as *cis*- or *trans*-.

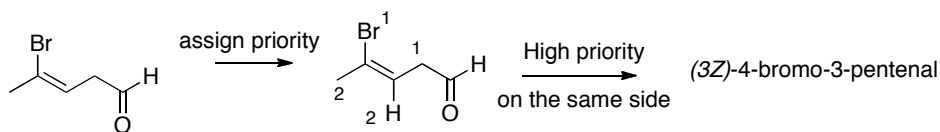


- If there are two or more substituents attached to an alkene the isomer may be labeled as *E* or *Z*
  - All *cis*- molecules are *Z*, but not all *Z* molecules are *cis*-; all *trans*- molecules are *E*, but not all *E* molecules are *trans*-. *Cis*- and *trans*- are accepted when appropriate, but *E* and *Z* work for all asymmetrical alkenes.
- Assigning Relative Configuration: *E* vs. *Z*
  - For each  $sp^2$  carbon in the alkene identify the two substituents and prioritize them 1 and 2 using the Cahn-Ingold-Prelog Rules.
    - See Assigning Stereochemistry II
  - If both high priority groups are on the same side of the alkene the molecule is *Z*. (similar to a *cis*)
    - This can be remembered by *Z* is on the *Z*ame *Z*ide.
  - If the high priority groups are on opposite sides of the alkene the molecule is *E*. (similar to *trans*)
  - If there is no difference between the groups then the molecule is symmetrical and thus *E/Z* is unnecessary. (e.g. monosubstituted alkenes)

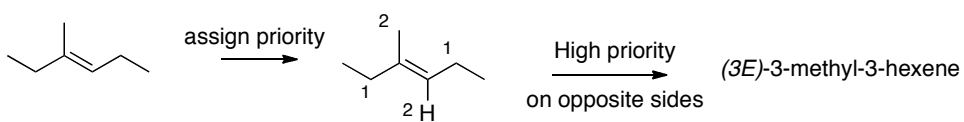


## Examples:

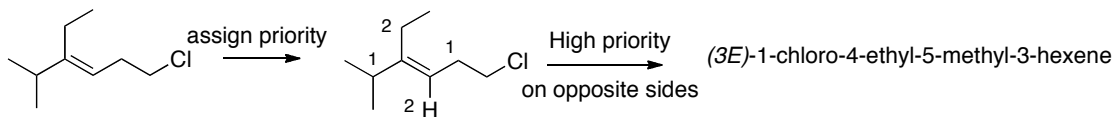
Compound A:



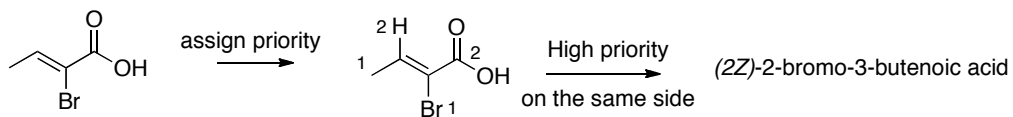
Compound B:



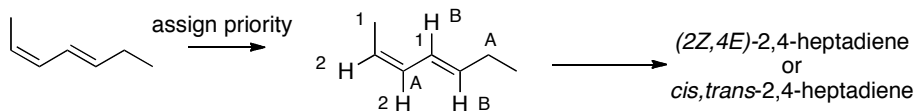
Compound C:



Compound D:

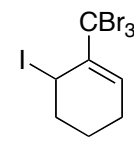
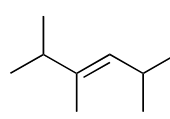
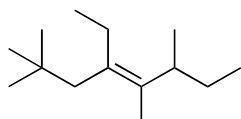
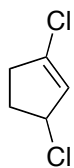
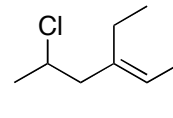
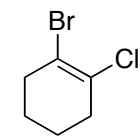
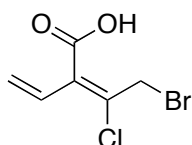
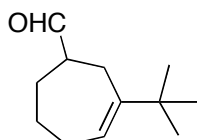
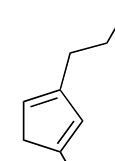
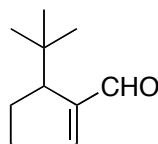
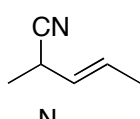
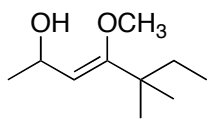
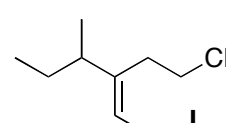
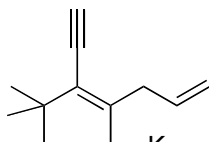
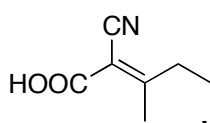
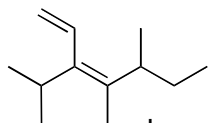
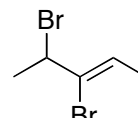
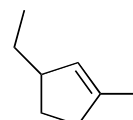
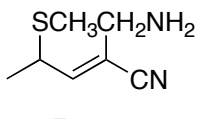
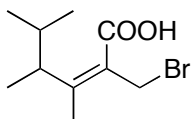
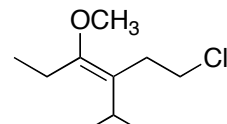
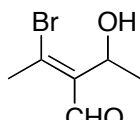
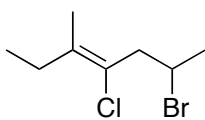
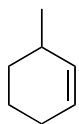


Compound E:



### Practice Examples:

Assign *E* or *Z* to each molecule.



### Practice Examples Key:

