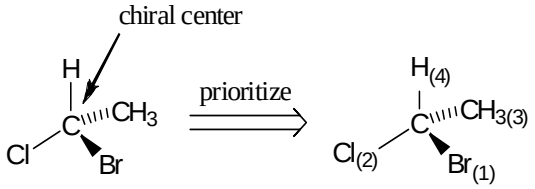
Priority Rules for Naming Chiral Centers - The R,S System

1. Prioritize the four atoms, or groups of atoms, attached to the chiral center based on the atomic number of the atom that is bonded directly to the chiral center. The higher the atomic number, the higher the priority.

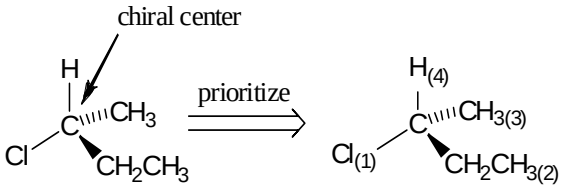
   - Number the four atoms, or groups of atoms, such that "1" has the highest priority and "4" has the lowest priority.

atomic	numbers
H	1
C	6
Cl	17
Br	35

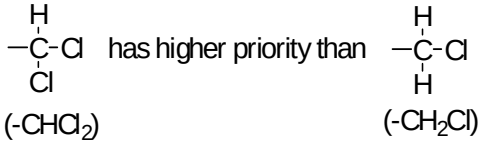


2. If two or more of the atoms that are bonded directly to the chiral center are the same, then prioritize these groups based on the next set of atoms (i.e., atoms *adjacent to* the directly-bonded atoms). Continue until priorities can be assigned. Priority is assigned at the first point of difference.

atomic	numbers
H	1
C	6
Cl	17



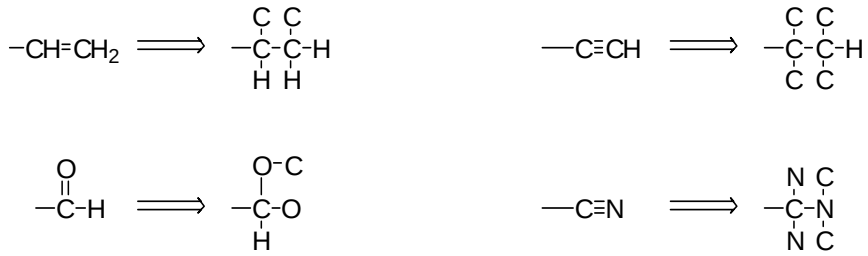
   - If two atoms have substituents of the same priority, higher priority is assigned to the atom with *more* of these substituents.



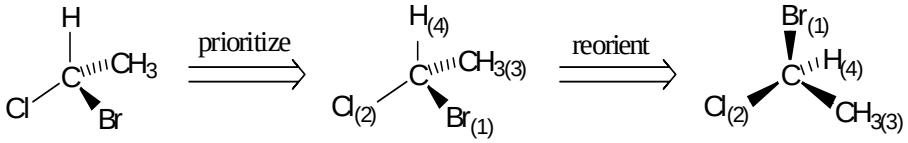
   - A larger group (i.e., more atoms) may not necessarily have a higher priority over another (smaller) group.

$-CH_2Cl$ has higher priority than $-CH_2CH_2CH_2CH_3$

3. Atoms participating in double/triple bonds are considered to be bonded to an equivalent number of similar "phantom" atoms by single bonds. *Note: "phantom" atoms are bonded to no other atoms.*



4. Orient the molecule in space so that the lowest priority group (#4) is directed away from you. The three remaining groups then project toward you.



5. If the three groups projecting toward you are ordered from highest priority (#1) to lowest priority (#3) *clockwise*, then the configuration is "**R**". If the three groups projecting toward you are ordered from highest priority (#1) to lowest priority (#3) *counterclockwise*, then the configuration is "**S**".