

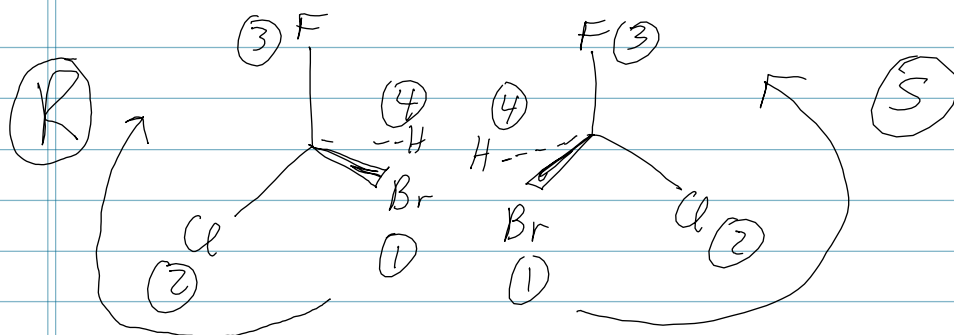
### Stereoisomerism

## 3) Cahn-Ingold-Prelog (CIP) system

Rule 1) Rank substituents by  $Z$  of attached atoms

highest  $Z \Rightarrow$  priority #1

lowest  $Z \Rightarrow$  " #4



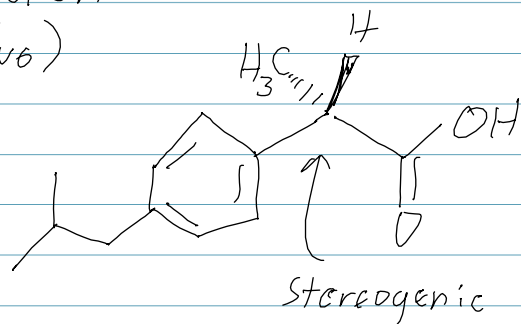
Rule 2) Arrange so #4 is in back

Rule 3) Trace out arc  $\begin{matrix} \textcircled{1} \\ \downarrow \\ \textcircled{3} \leftarrow \textcircled{2} \end{matrix}$  if cw  $\Rightarrow$  R isomer

ccw  $\Rightarrow$  S isomer

Rule 4) Tie-breaker - compare lists of  $Z$  for attached to directly attached atom  
= Sort from high  $Z$  to low  $Z$

(S) - ibuprofen (active)



H: 1  $\leftarrow$  #4  
 $-\text{COOH}$ : 6 (8, 8, 8) #1  
 $-\text{CH}_3$ : 6 (1, 1, 1) #3

as drawn:  $\begin{matrix} \text{cw} \\ \curvearrowright \end{matrix}$

substituent: 6 (6, 6, 6) #2

(but H in front!)  $\Rightarrow$  if H in back  $\Rightarrow$  ccw  $\Rightarrow$  S