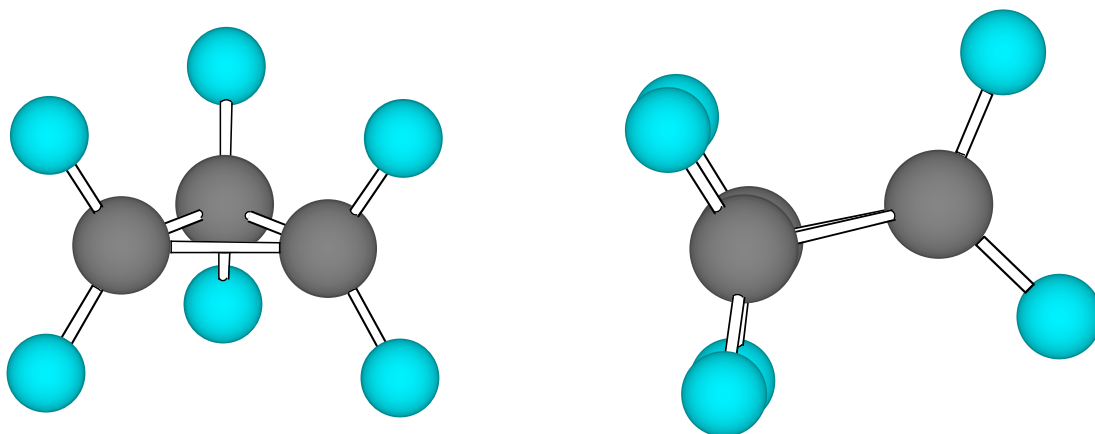


Conformers of Cyclopropane and Cyclobutane

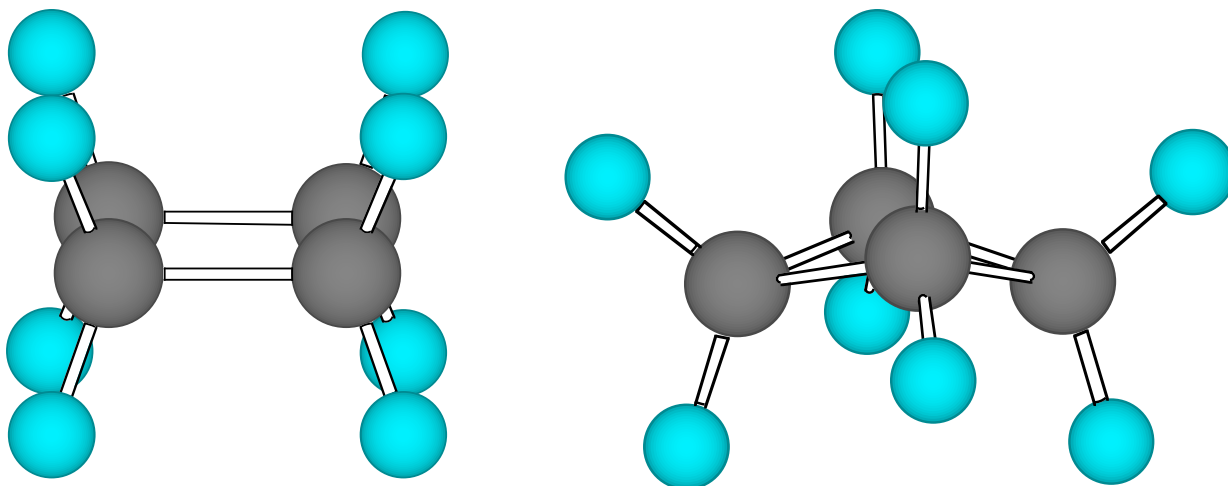
Cyclopropane (C_3H_6) is planar (three points define a plane)

- angle strain ($C-C-C = 60^\circ$)
- torsional strain (all $C-H$ bonds eclipsed)



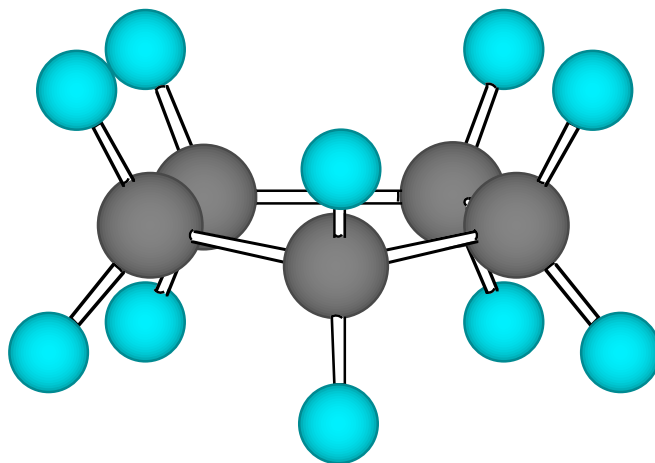
Cyclobutane is puckered

- planar cyclobutane has all $C-H$ bonds eclipsed (not a minimum)
- puckered cyclobutane trades increased angle strain for decreased torsional strain



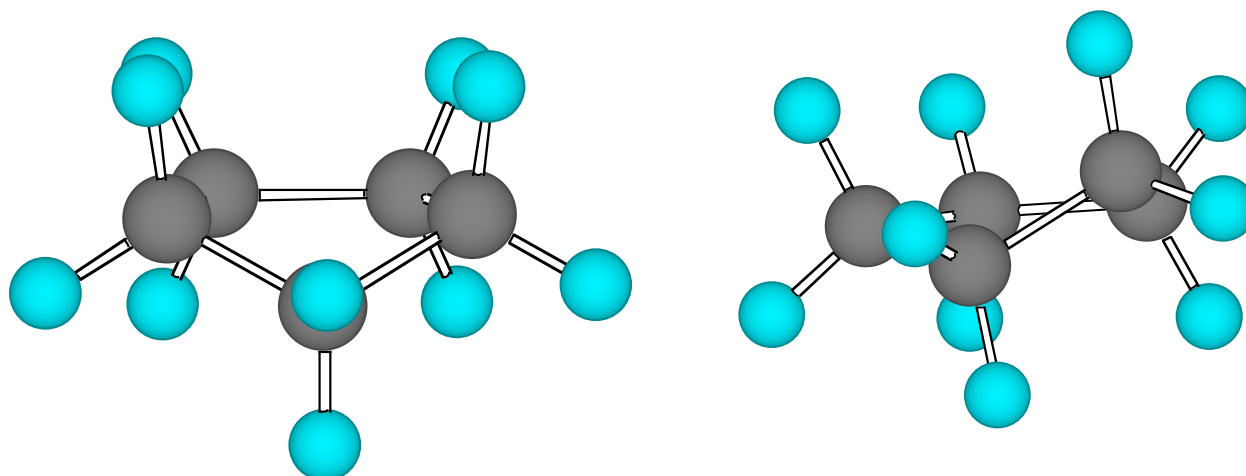
Conformers of Cyclopentane

Planar Cyclopentane (C_5H_{10}) has almost no angle strain (108°) but all C–H bonds are eclipsed; *not a minimum*



Cyclopentane has two conformers of similar energy

- envelope (4 atoms in a plane, 1 out)
- twist (3 atoms in a plane, 1 above, 1 below)

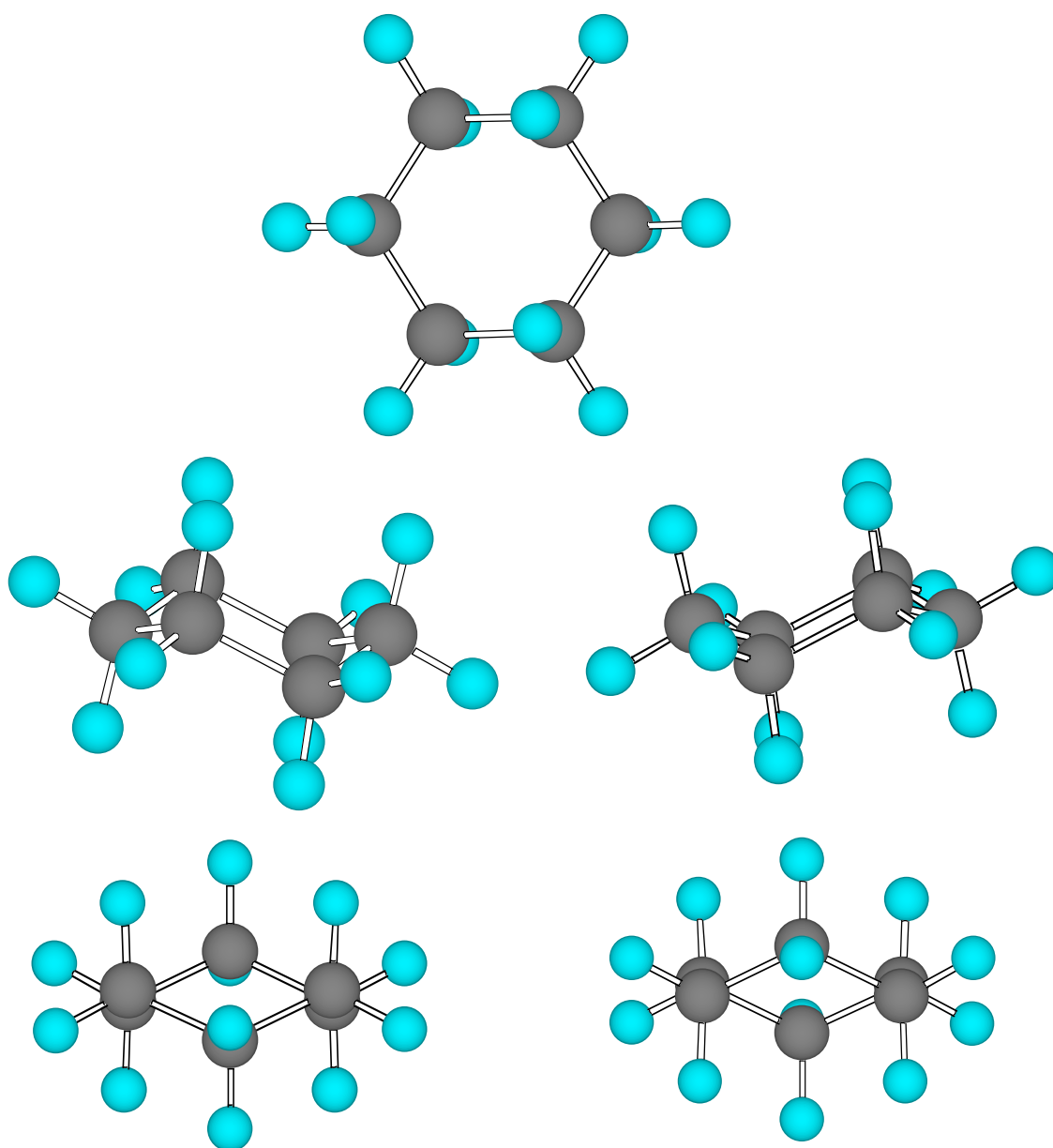


Cyclohexane Chair Conformation

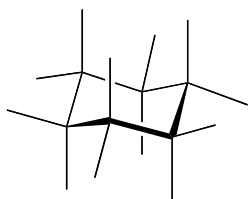
Planar Cyclohexane (C₆H₁₂) has angle strain (120°)
and all C–H bonds are eclipsed; not a minimum

Cyclohexane has one low energy conformer

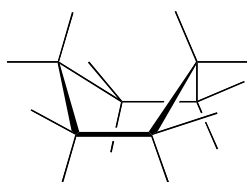
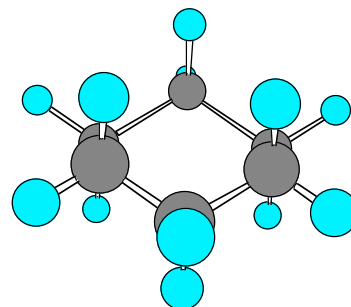
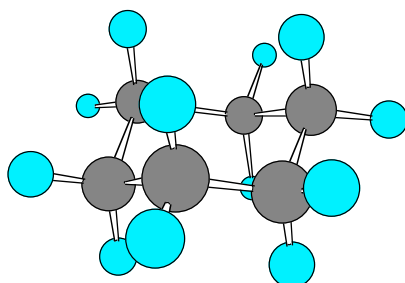
- chair shape with "axial" and "equatorial" H's
- "flipping" the chair exchanges all "a" and "e" H's
- other conformers will be introduced later



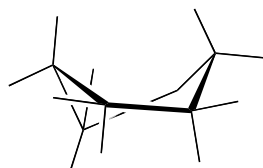
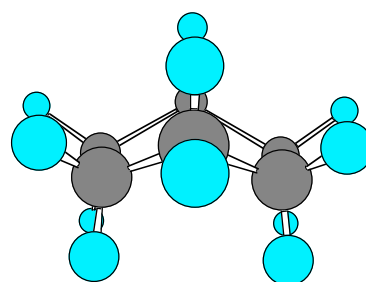
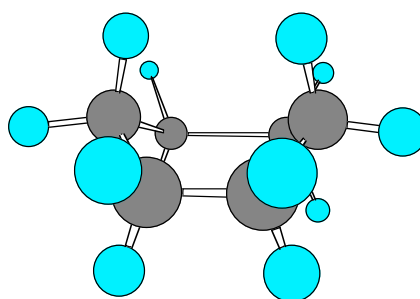
Cyclohexane Conformers



chair



boat



twist boat

