(27) **Today**

Sections 5.1 – 5.5
Chirality and Determining the Configuration of Chiral Centers

Next Class (28)

Sections 5.6 – 5.12
Diastereomers, N,P, and S, and Prochirality

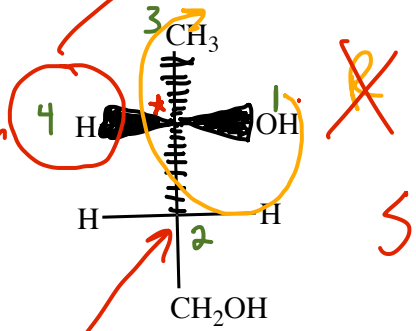
(29) **Second Class from Today**

Chap 6

Third Class from Today (30)

Chap 6

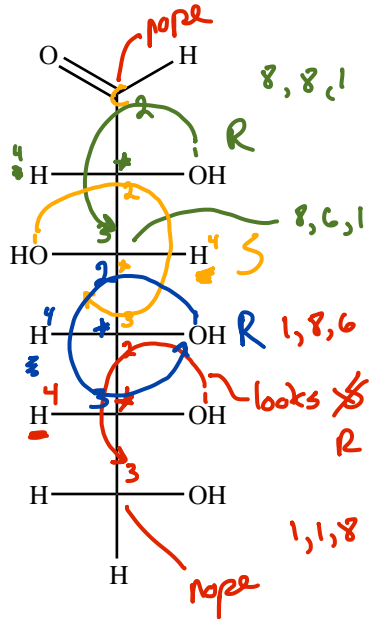
vertical bonds recede from the viewer
horizontal bonds are coming towards the viewer



not chiral

lowest priority group was in opposite position so answer is opposite of the 1→2→3 arrow

S



top C 8, 1, 6 → 1, 8, 6

bottom C 1, 8, 6 → 1, 1, 8

H z = 1

CH_3 z = 6 z = 1, 1, 1

OH z = 8

CH_2CH_2OH z = 6 z = 1, 1, 6

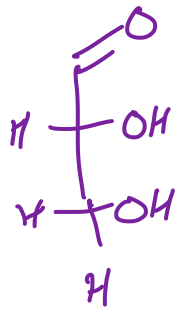
lowest priority group is pointed towards me which means it is opposite to where it is supposed to be so the configuration must be opposite the 1→2→3 circle that was drawn

R, S ; d, l ; D, L are not related

(chiral centers

+, − (determined experimentally

D, L has an arrangement of atoms that resembles d-glyceraldehyde



)

the chiral center or a molecule can have an R or S configuration

1 chiral center ....

R enantiomer
+
S enantiomer

more than 1 chiral center ... you have to specify all chiral centers

Determining Configuration (*R* vs *S*)

Highest atomic # gets 1st

Assign priorities to groups connected to chirality center

Point lowest priority group away

Draw a circle from 1st to 2nd to 3rd priority groups

Clockwise circle is **R** configuration

Counter Clockwise circle is **S** configuration

1. Draw a tetrahedral C atom

2. Assign priorities to the groups

3. Place the lowest priority group so that it points away

4. Draw in priority groups 1 through 3 in the correct (clockwise or counterclockwise) orientation.

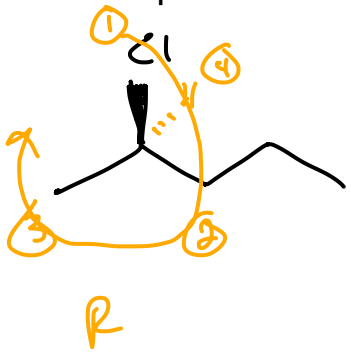
1. Draw the molecule

2. Assign priorities and check if the correct configuration is drawn

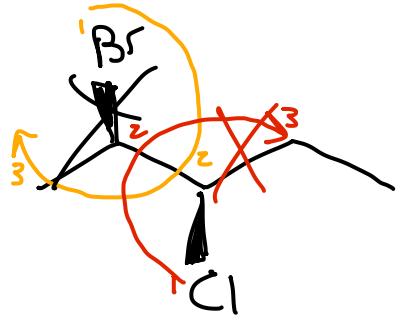
3. a. If correct, celebrate, you're done

3. b. If incorrect version is drawn, redraw molecule switching the positions of 2 (and only two) substituents.

(*R*)-2-chloropentane

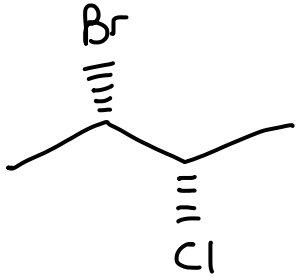


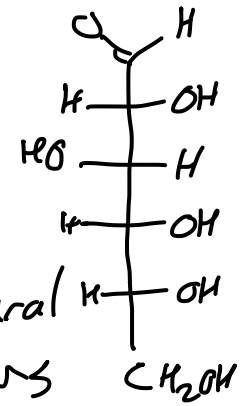
(2*S*,3S)-2-bromo-3-chloropentane



2S,3S 2S,3R 2R,3S 2R,3R

this molecule exists as 4 stereoisomers





4 chiral centers

$2^4 = 16$

Maximum possible number of stereo isomers

$$2^n$$

where n is the number of stereogenic centers

Stereogenic centers are locations that cause the molecule to exist as different stereoisomers:

R vs S, *cis* vs *trans*