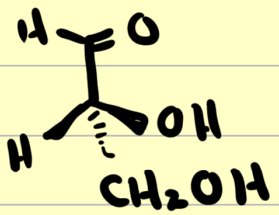
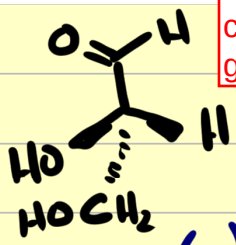
So how can one relate structure to optical rotation? The realtionship is *so* complex, that until ca. 1950, one could only guess....

So here's the guess; glyceraldehyde is easy to convert to many other compounds, so it was a great starting point



(+).



(-).

GUESS.

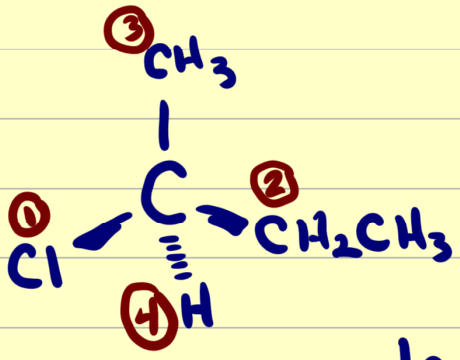
GLYCERALDEHYDE

1951- XRAY CRYSTALLOGRAPHY PROVED THIS GUESS CORRECT.

'd', or 'l' or '+' or '-' will still be seen occasionally, but it is not systematic

SYSTEMATIC WAY OF NAMING ENANTIOMERS

CIP SYSTEM, SIMILAR TO ALKENES, IS USED TO BE RIGOUROUS



(5)-

a) RANK THE 4 GROUPS 1,2,3,4 IN ORDER OF PRIORITY.

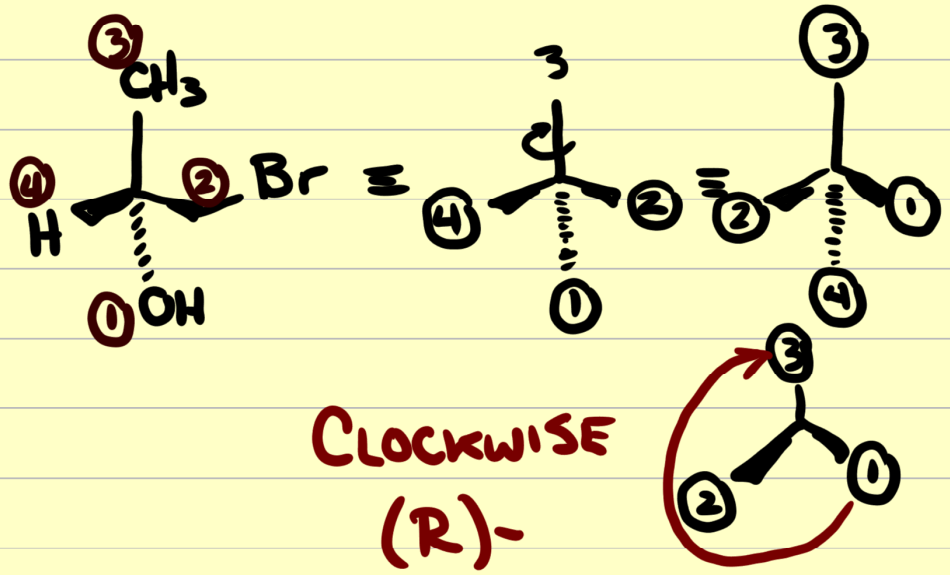
b) ORIENT MOLECULE SUCH THAT LOWEST PRIORITY GROUP IS DIRECTED AWAY FROM READER (4)

c) TRACE 1 → 2 → 3

d) IF TRACE IS CLOCKWISE, IT'S (R)- ENANTIOMER
IF TRACE IS COUNTERCLOCKWISE, IT'S THE (S)- ENANTIOMER

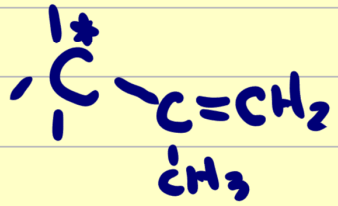
(S)- 2-CHLOROBUTANE

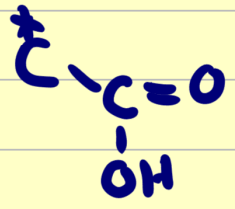
CONSIDER



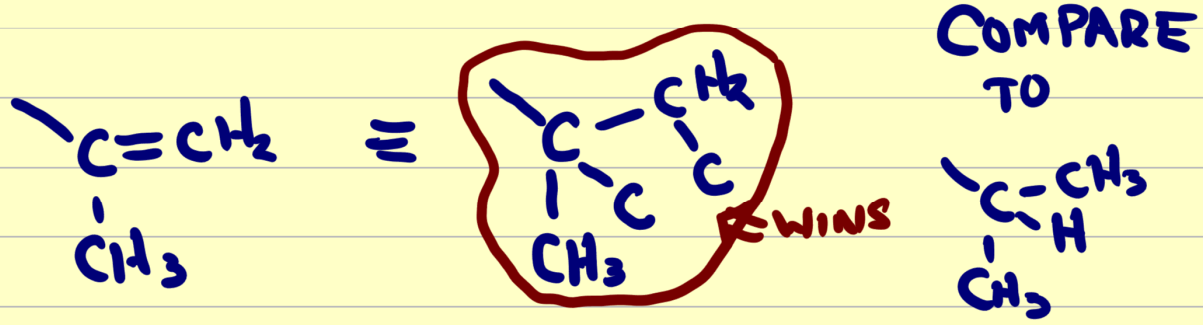
(R)- 1-BROMO-2-PROPANOL

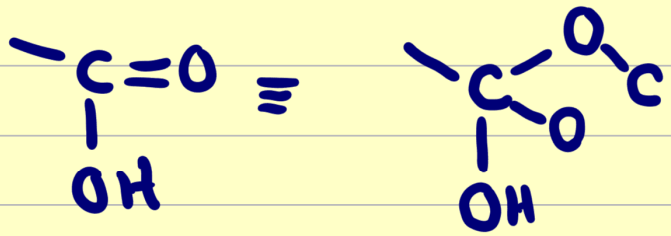
ADDENDUM ON PRIORITY RULES
- MULTIPLY BONDED FUNCTIONAL GROUPS

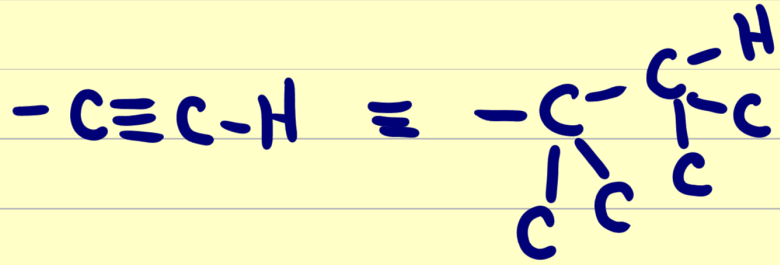




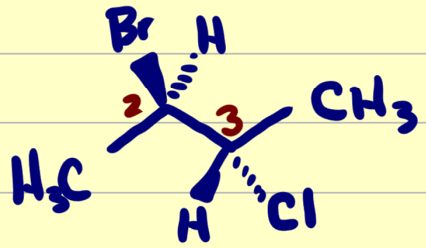
- FOR PRIORITY PURPOSES ONLY,
  REPLACE MULTIPLY BONDED ATOMS BY A EQUAL # OF SINGLY BONDED ATOMS







WITH 2 CHIRAL CENTRES- HOW DO YOU DO THIS?

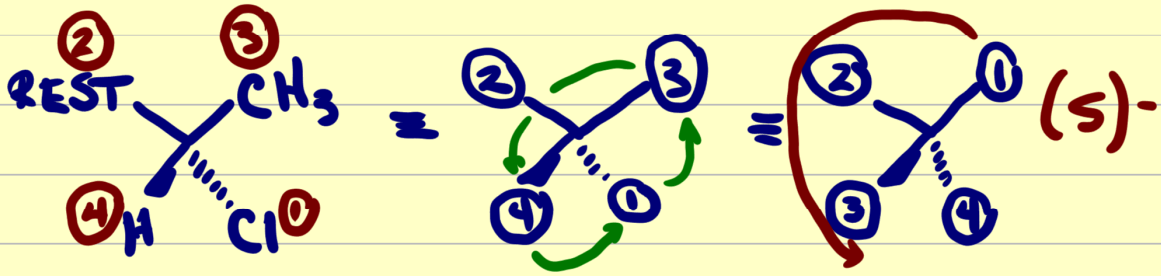


2-BROMO-3-CHLOROBUTANE

- CONSIDER THE CHIRALS ONE AT A TIME

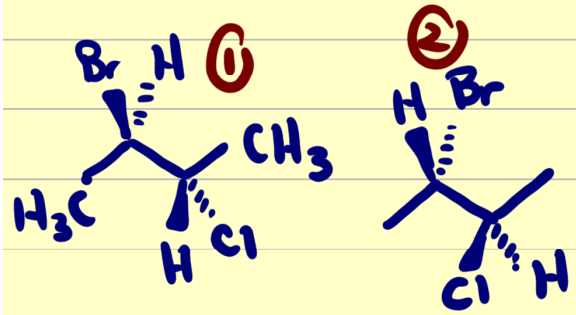
C-2 

(R)-

C-3 

(S)-

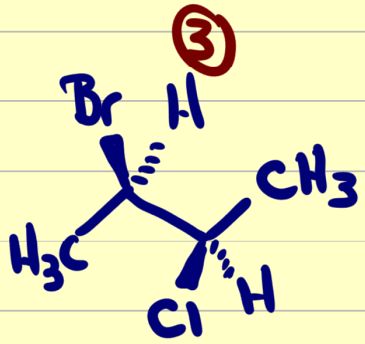
(2R,3S)- 2-BROMO-3-CHLOROBUTANE



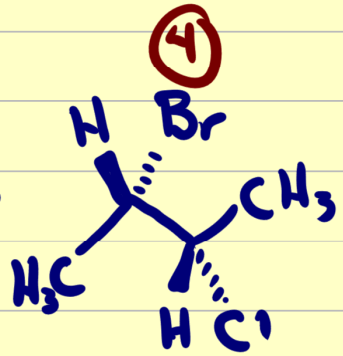
2R,3S

2S,3R

ENANTIOMERS



2R,3R



2S,3S

ENANTIOMERS

How About ① & ③ or ② & ④

- NOT ENANTIOMERS, BUT RATHER DIASTEREOMERS.