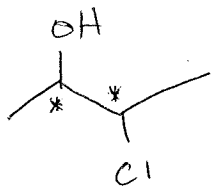
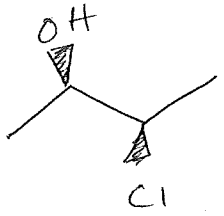
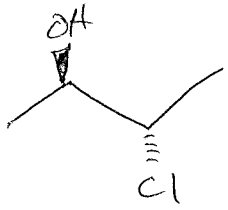
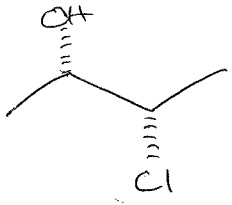
For every 'n' stereocenter
there are 2^n possible stereoisomers

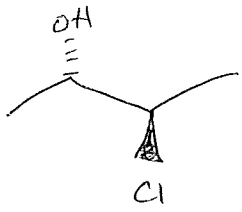
3-chloro-2-butanol



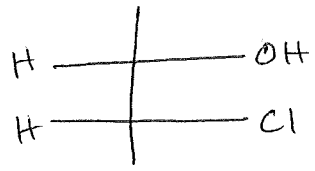


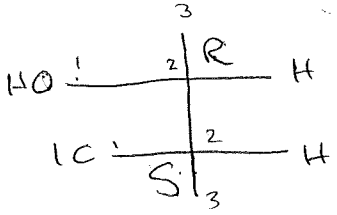




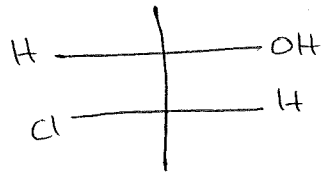


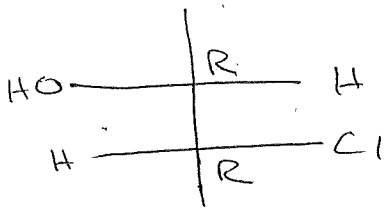
* Matching.





enantiomers
'Erythro'



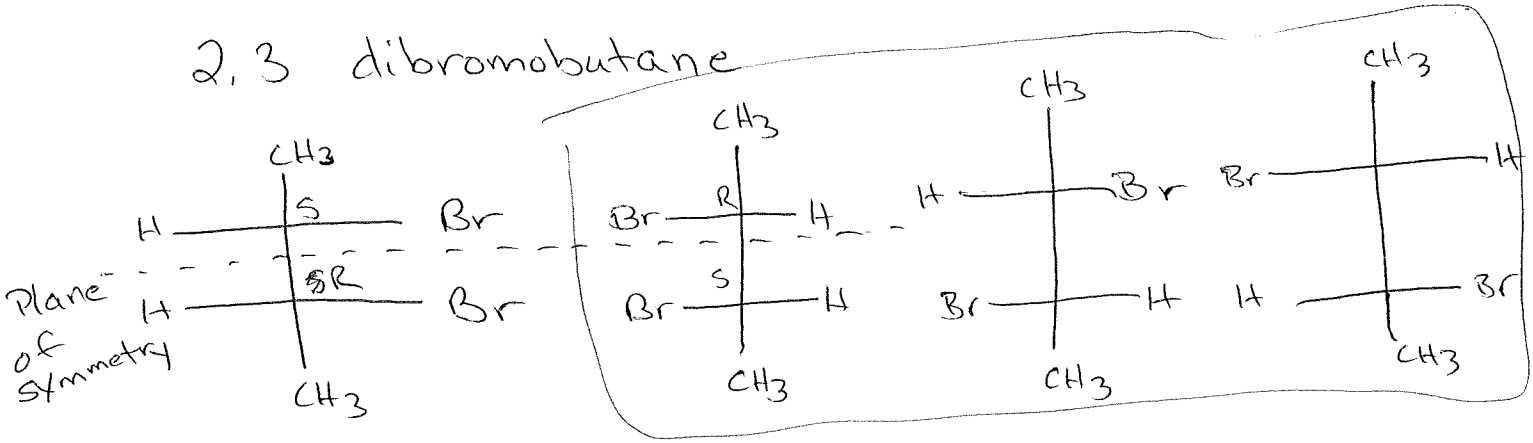


enantiomers
'Threo'

not the same

diastereomers
different physical properties.
Can be separated physically

2,3 dibromobutane

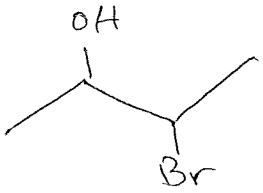


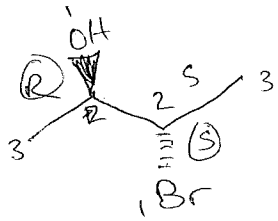
SAME
meso-compound

★ meso compound has chiral centers but it is achiral because the molecule has a plane of symmetry.

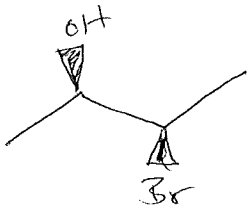
Naming

3-bromo-2-butanol

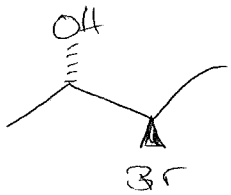




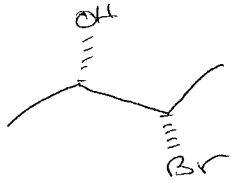
(2R,3S) 3-bromo-2-butanol



(2R,3R)-



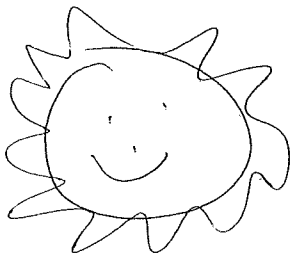
(2S, 3R)

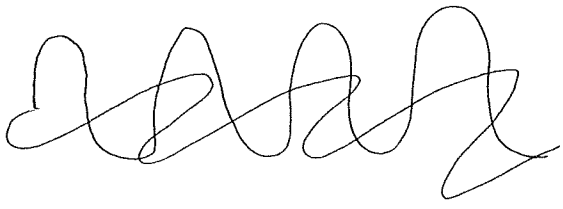


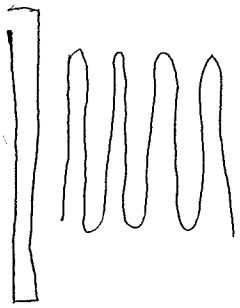
(2S, 3S)

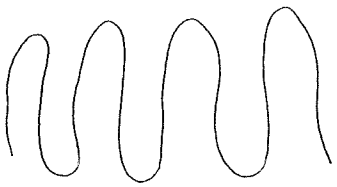
3-bromo-2-butanol

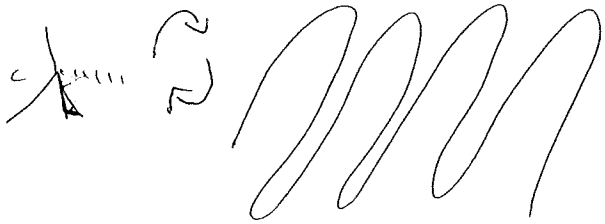
Optical Activity







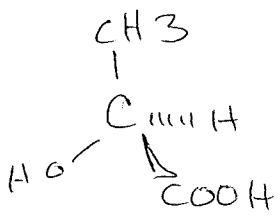




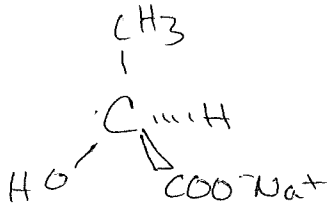
Rotate plane-polarized right or left.

↻ clockwise
(+)
dextrorotary D

↺
(−)
levorotatory L



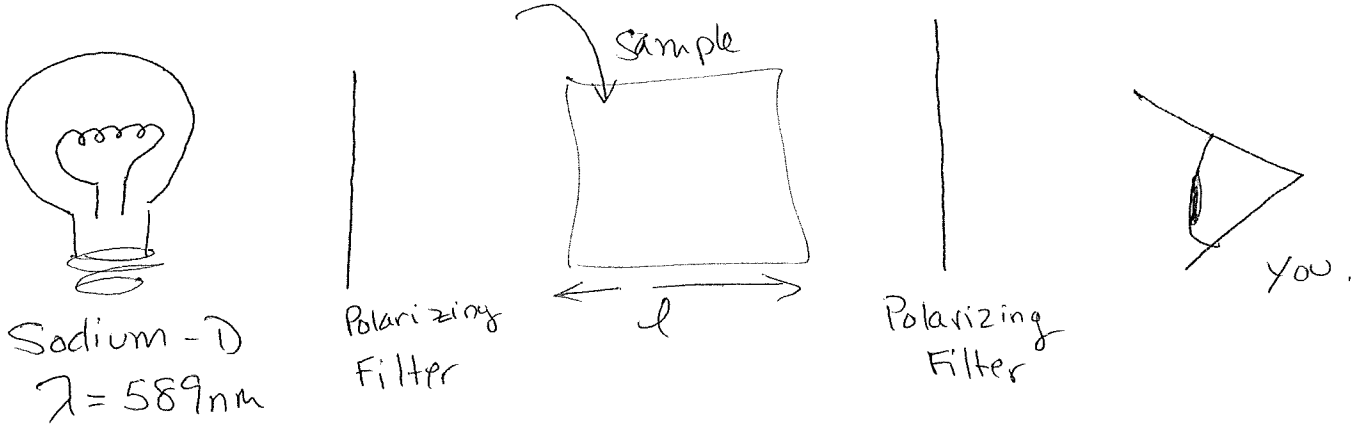
S- Lactic Acid
(+)



S - Lactate
(−)

Light rotation is experimentally determined.

Polarimeter.

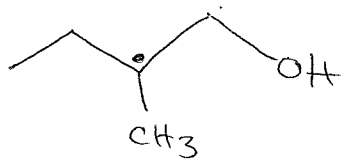


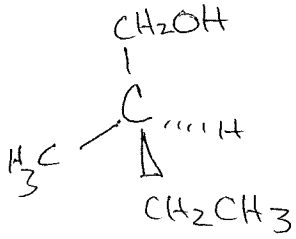
angle of rotation to block out light

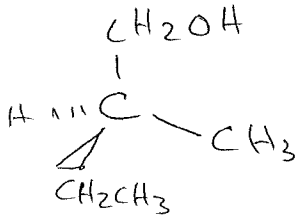
α - observed rotation

$$[\alpha]_{\lambda}^{T} = \frac{\alpha}{l \times c}$$

R- 2- methyl - 1- butanol







R

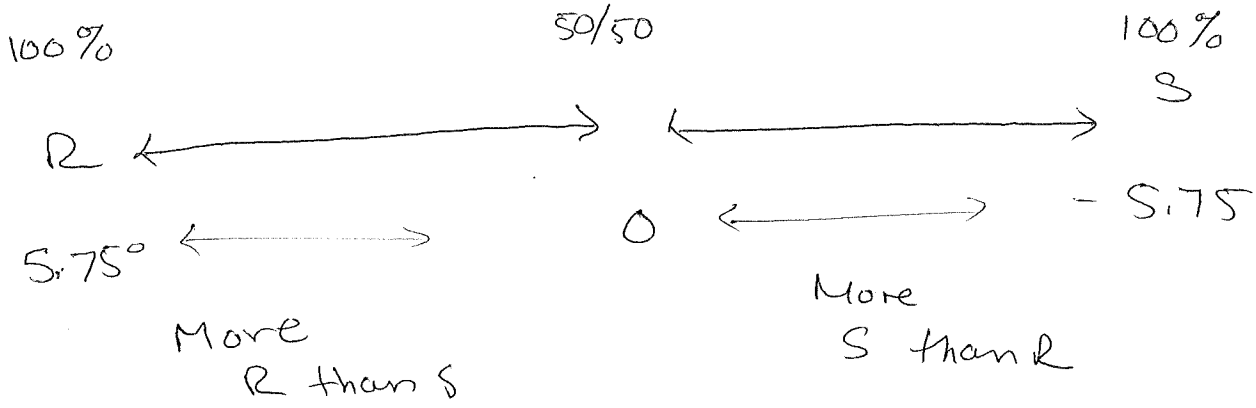
$[\alpha]_D^{20^\circ} = 5.75$

S

$[\alpha]_D^{20^\circ} = -5.75$

50/50 - Ø rotation

'racemic' mixture



enantiomeric excess (e.e.) $\frac{\text{obs rotation}}{\text{pure rotation}} \times 100 = \%$