

Definitions:

stereoselective rxns - the production of one stereoisomer is favored over others

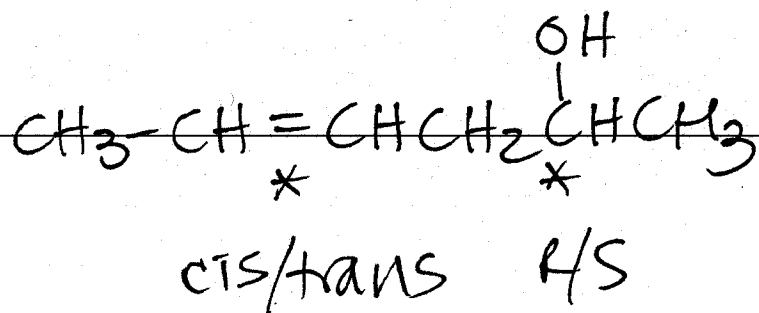
* enantioselective - one enantiomer is favored

* diastereoselective - one diastereomer is favored.

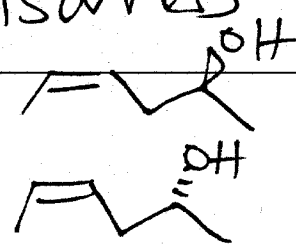
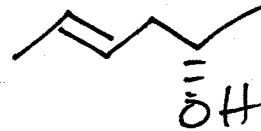
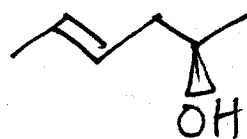
more than one stereogenic center -

total possible # of stereoisomers = 2^n

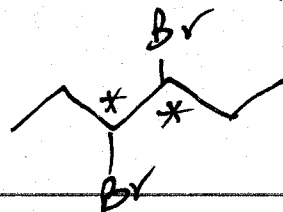
n = # of stereogenic centers.



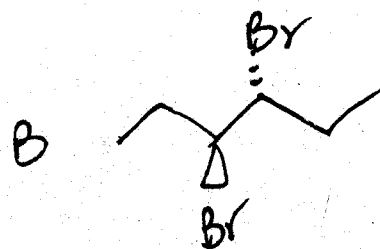
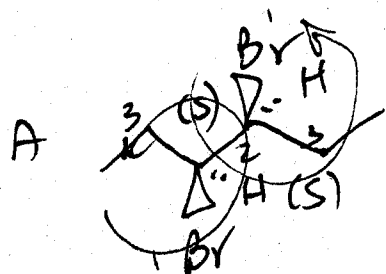
$2^2 = 4$ stereoisomers



consider ~~2,3~~ 3,4-dibromohexane.

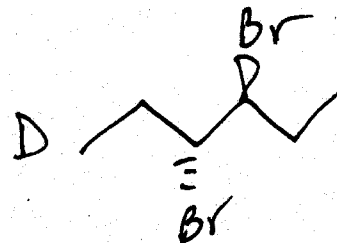
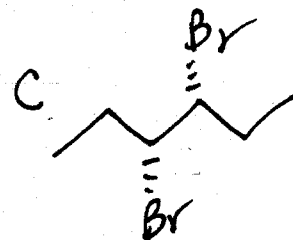


$$2^n = 2^2 = 4 \text{ possible stereoisomers.}$$



A: S, S

B: S, R



C: R, R

D: R, S

What are the relationships between pairs?

A + C - e A + D - d

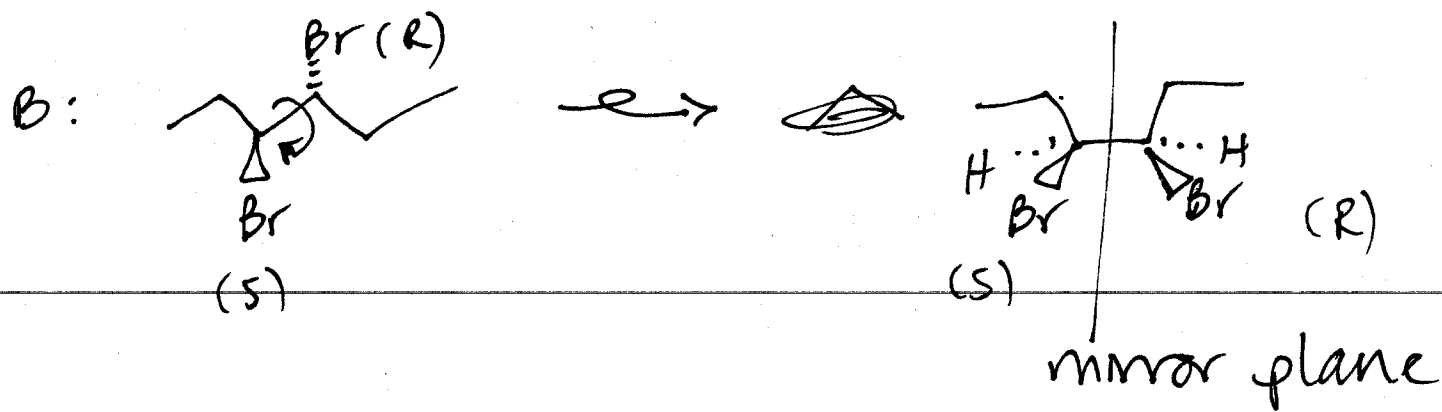
B + D - i B + C - d

A + B - d C + D - d

e = enantiomers

d = diastereomers

i = identical

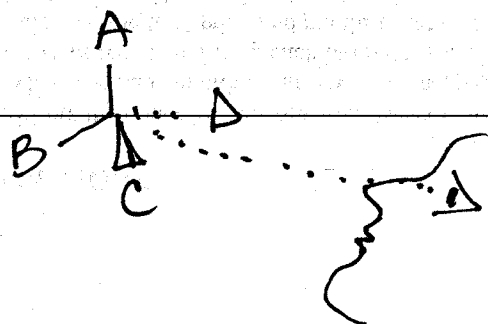


* a molecule containing chirality centers can still be achiral! \Rightarrow meso compound

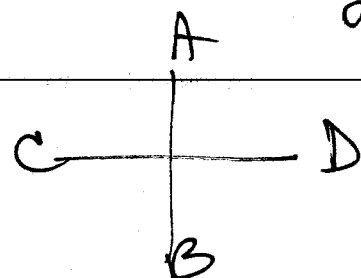
\Rightarrow 3,4-dibromohexane had 4 possible stereoisomers but only 3 actual stereoisomers -

a pair of enantiomers (R,R) + (S,S)
and a meso compd. (R,S)

Fischer projections - { mostly used in carbohydrates



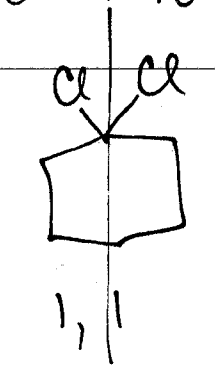
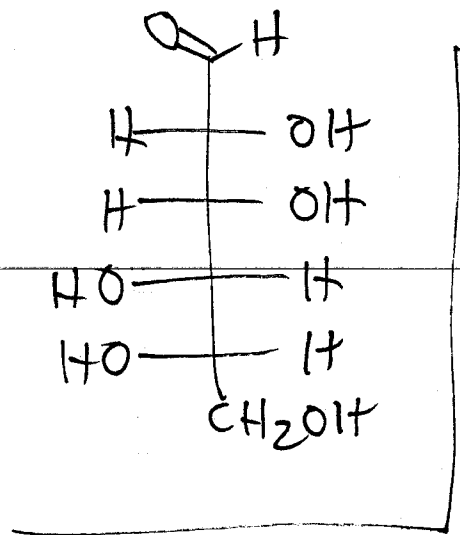
horizontal bonds \equiv
are coming
towards you



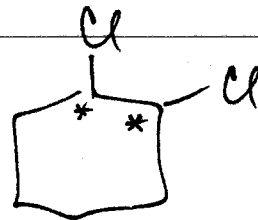
verticals
are going
away
from
you.

stereoisomerism in cyclic Compds.

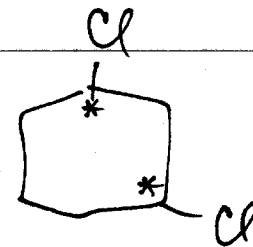
consider dichlorocyclohexane.



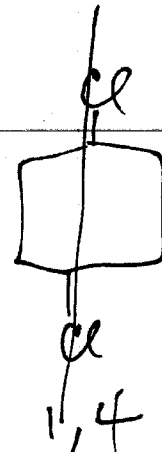
achiral



cis
trans



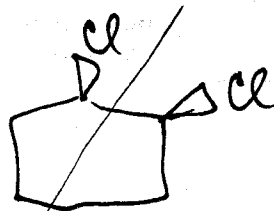
cis
trans



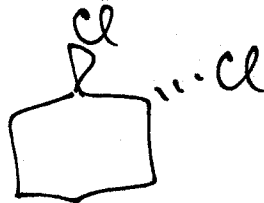
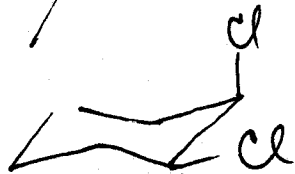
cis
trans

achiral

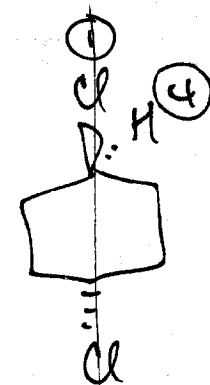
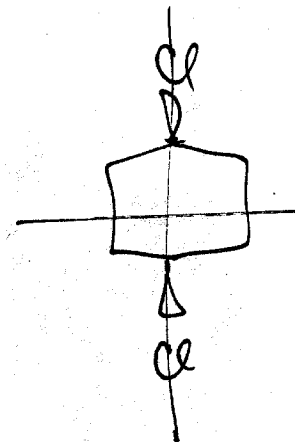
* cis + trans are diastereomers.



meso



R,R or
S,S



each side
of the
ring is the
same.



Relative configurations - we know a rxn went w/ retention (or w/ inversion) but we don't necessarily know what we started with.

Absolute config. - we know. (Before 1951, nobody knew absolute configs - all relative.)

Resolution of enantiomers - separating them.

Pasteur's method: racemic tartaric acid crystallizes into mirror images!

*proved the existence of enantiomers