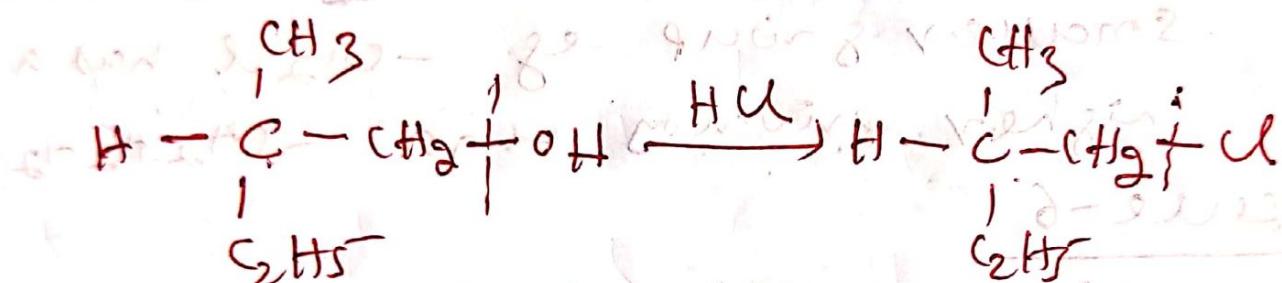


Reactions of chiral molecules

① Reactions where bonds with the chiral center are not broken:-

→ These reactions can be used to relate configuration of one compound to that of another.

→ Configuration is retained when reaction doesn't involve breaking either of σ bonds to a chiral center.

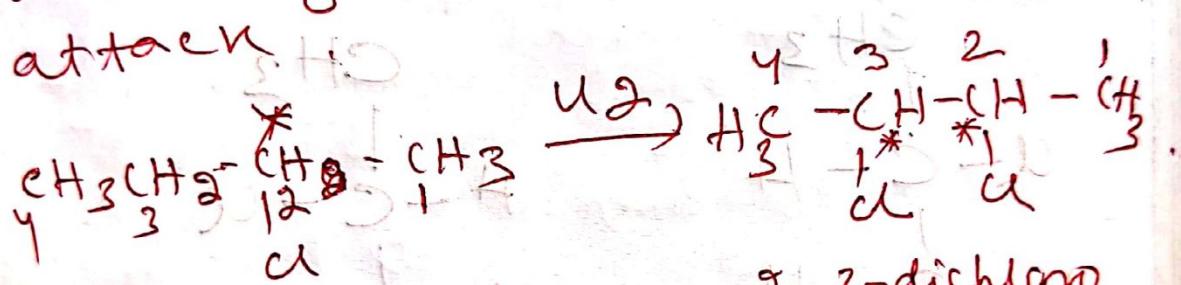


(S)(-)-1,2-methyl-1-butanol (S)(+)-1-chloro-2-methylbutane

Here as the bond to the chiral center is not broken, (S) config is retained. This retention of config is utilized to determine configurational relationship b/w two optically active compds by converting them into each other by reac's that don't involve breaking of a bond to a chiral center.

Reactions leading to generation of chiral center :-

Generation of first chiral center in a compound yields equal amounts of enantiomers (racemic mixture) but reactions that form second / new chiral center yields unequal amounts of diastereomers depending on the side of attack.



sec-butyl chloride

2,3-dichlorobutane

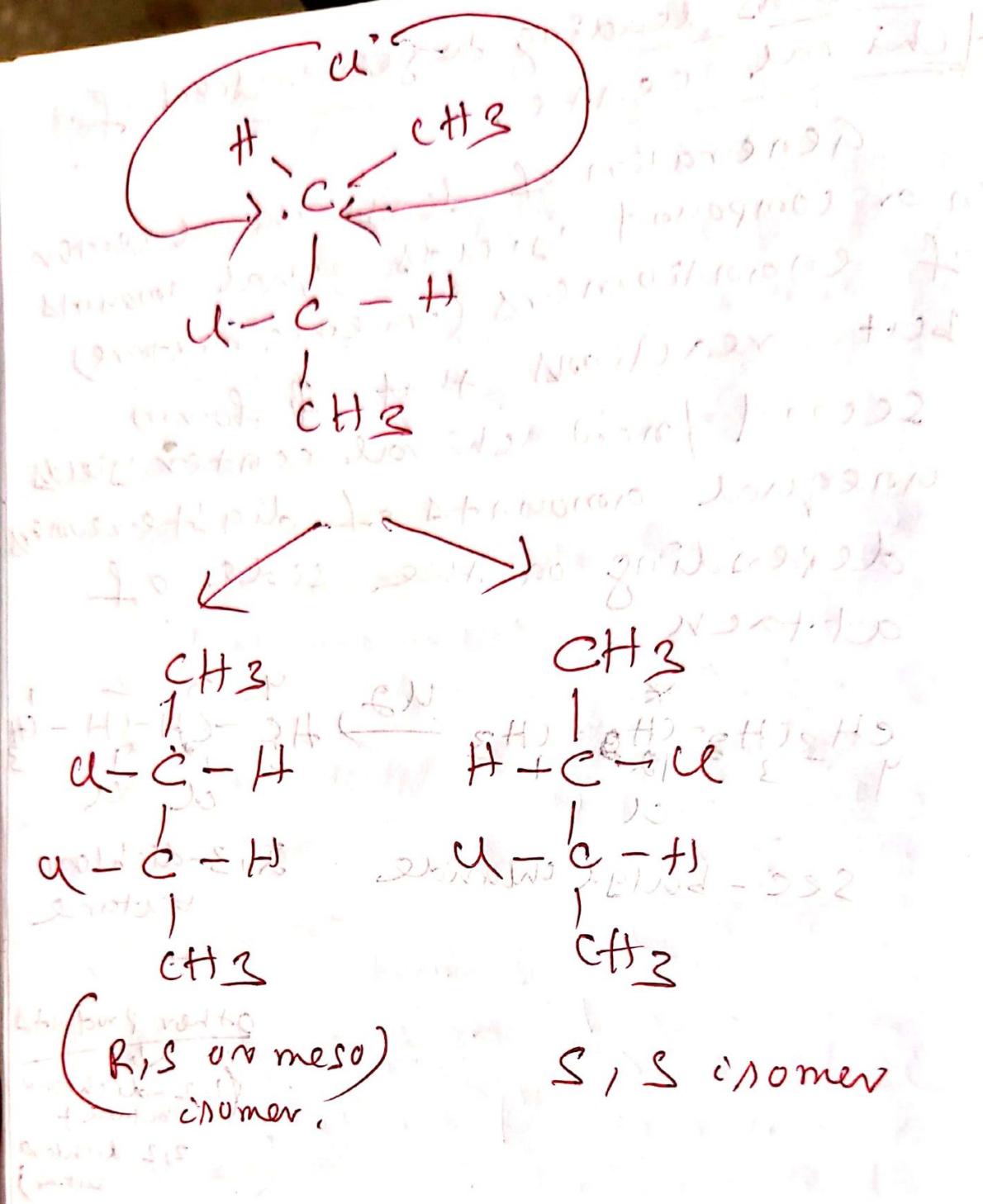
5(+)

other products

(1,2-dichlorobutane + 2,2-dichlorobutane)

① Retention of configuration occurs as there is no bond breaking to the original chiral center C-2.

② For new chiral centers, depending on side of attack from the same or opposite side, diastereomers are formed but in unequal amounts.



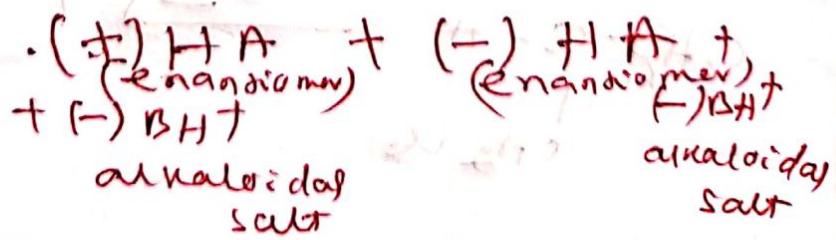
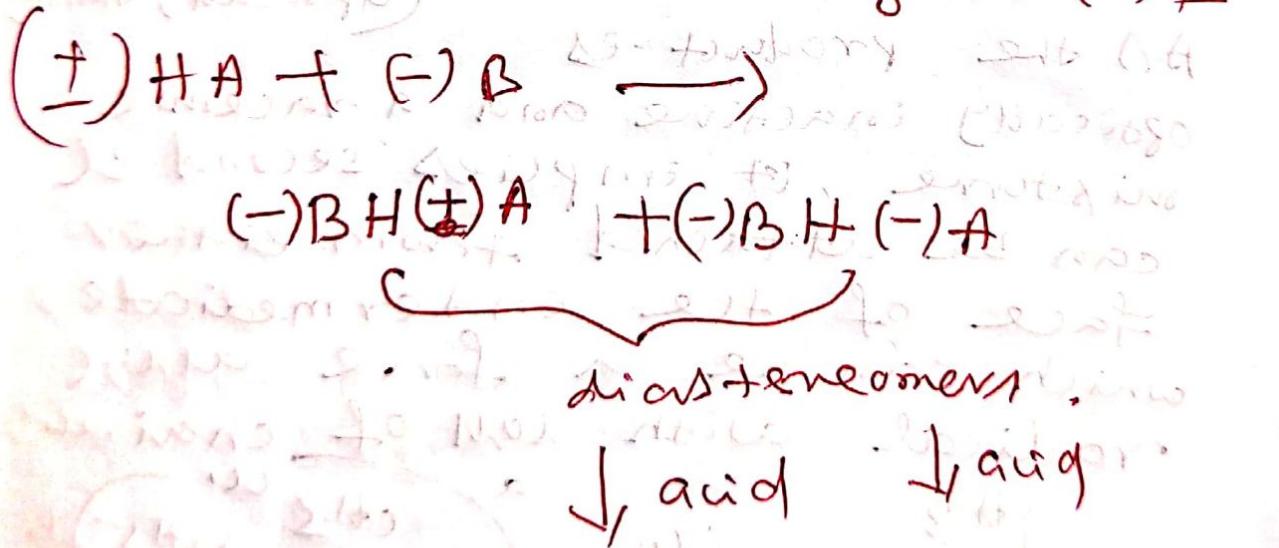
③ Reactions of chiral compounds with optically active reagents

Such reagents are used in resolution or separation of a racemic mixture / modification / into two individual enantiomers.

• Similar elements have similar physical properties

They can't be separated by usual methods. To separate pure enantiomers from racemic modification, optically active reagent is used to convert enantiomers into diastereomers. Diastereomers can easily be separated as they have different physical & chemical properties by fractional distillation or crystallization. Then resolved enantiomers can be recovered from the soln. (mixture containing diastereomers).

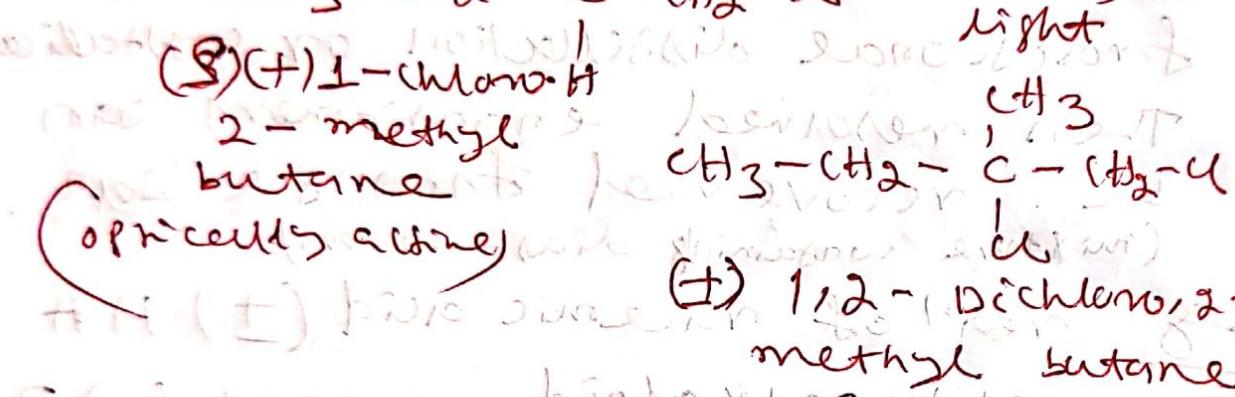
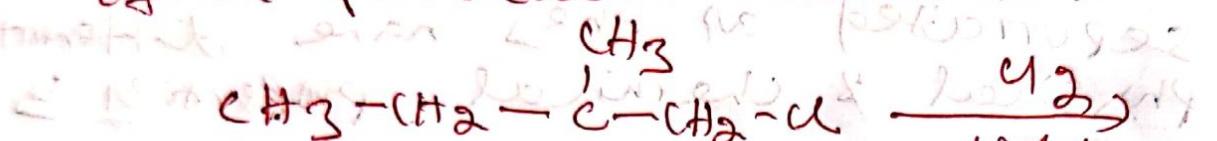
8 test of racemic acid (\pm) HA
with alkaloid reagent (-) B



Alkaloid bases (commonly used are (-) brucine, (-) quinine, (-) strychnine etc.)

4. Reactions where bonds with chiral center are broken

Stereochemistry of such reactions depend on the mechanism of the reaction. Hence stereochemistry can be helpful to give evidence of a particular mechanism.



All the products are optically inactive and a racemic mixture, it implies second Cl can be attached from either face of the intermediate, which can be a free radical with 1M of chirality.

