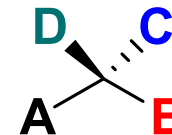
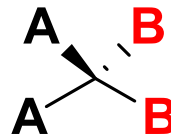
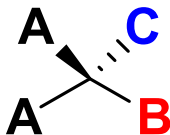
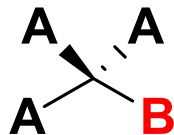


## Classification of the groups according to their symmetry. Schoenflies' point groups

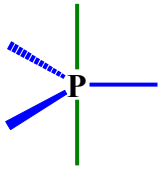
Objects (molecules) can be classified according to their symmetry.

Classification is much easier when we consider the presence (or not) the ALTERNATE axis ( $S_n$ ). The operation generated by this axis requires the rotation  $360/n$  + flip in horizontal plane ( $\sigma_h$ ). This means that the row of this axis must be even

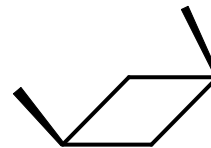
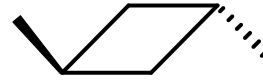
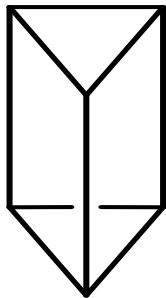
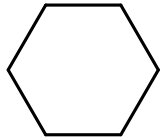
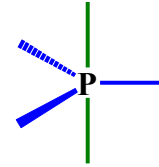
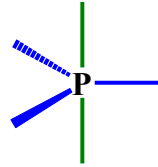
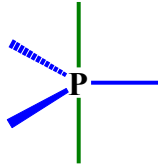
From the point of view of symmetry the molecules (objects) are either chiral (no axis  $S_n$ ) or achiral (presence of  $S_n$ )



Stereoisomerism of  
5-coordinated compounds

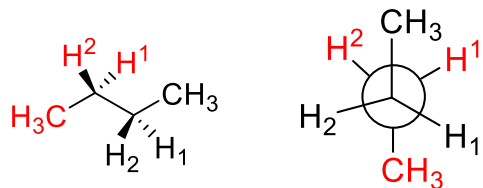


find elements of symmetry in Paabcd

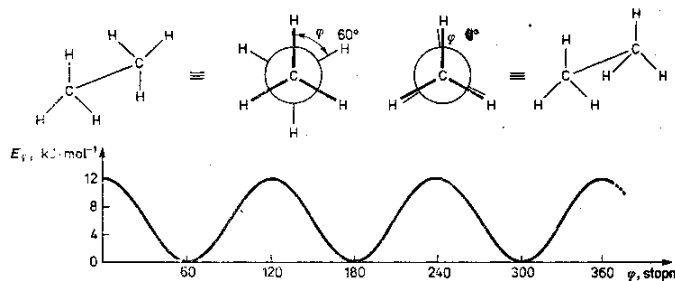
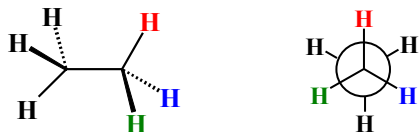


# Organic stereochemistry – lecture 2

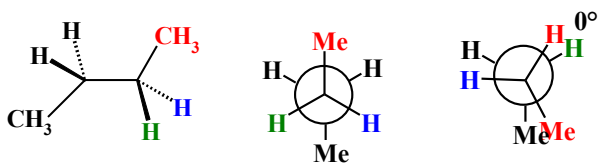
## Newman projection



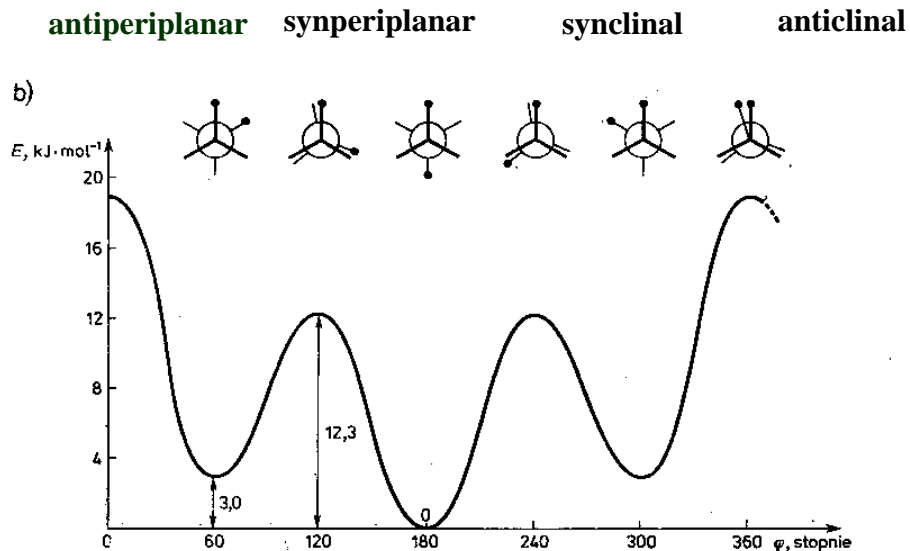
## Conformations of ethane



## Conformations of butane

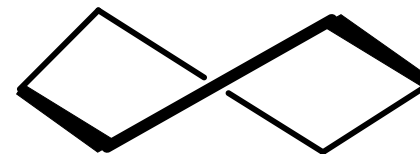
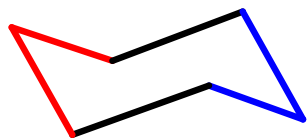
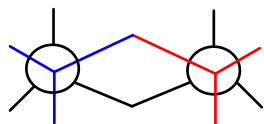
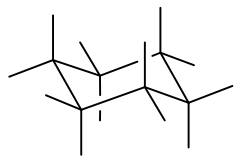


etc.

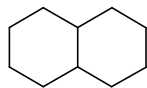
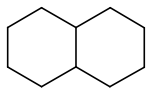


**cyclohexane**

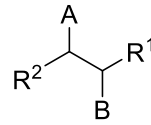
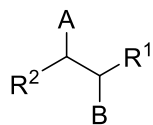
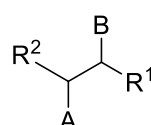
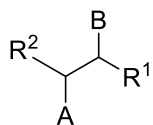
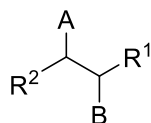
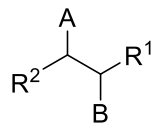
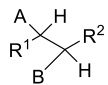
**NEWMAN' projection**



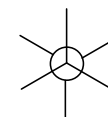
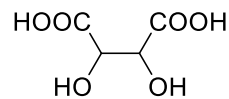
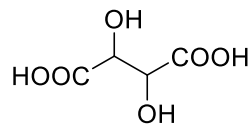
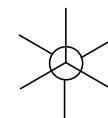
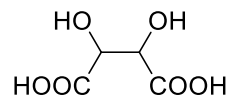
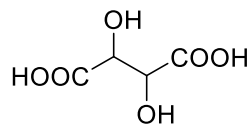
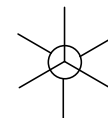
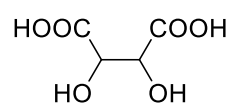
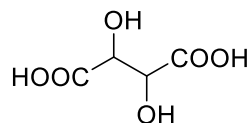
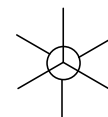
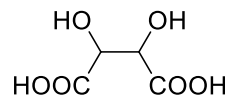
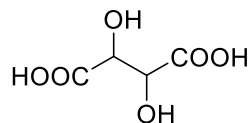
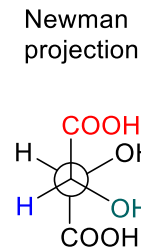
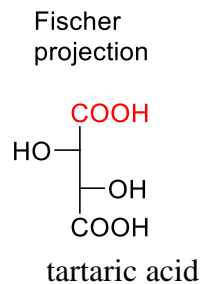
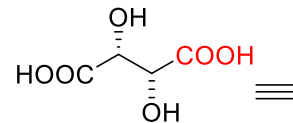
Find elements of symmetry in decalin



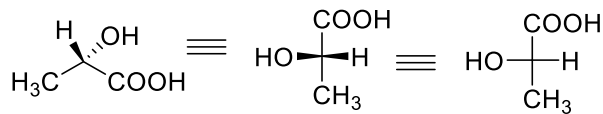
## Systems with TWO stereogenic centers



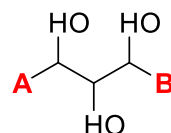
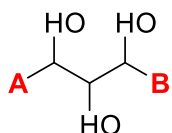
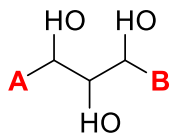
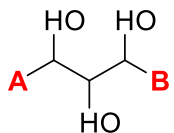
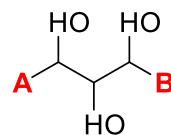
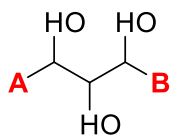
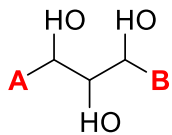
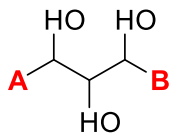
## More symmetrical derivatives 2 stereogenic centers



## lactic acid

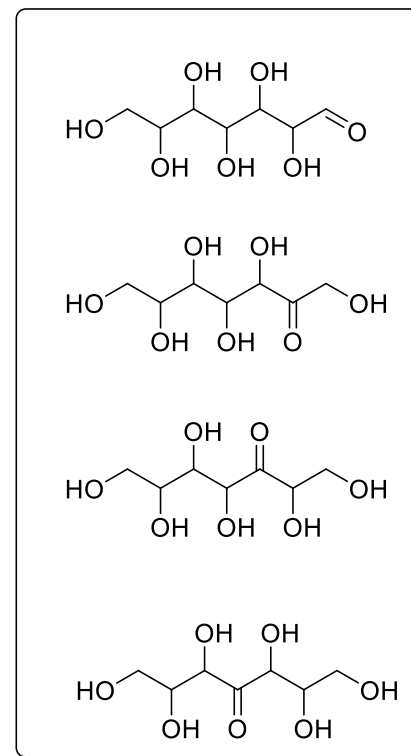
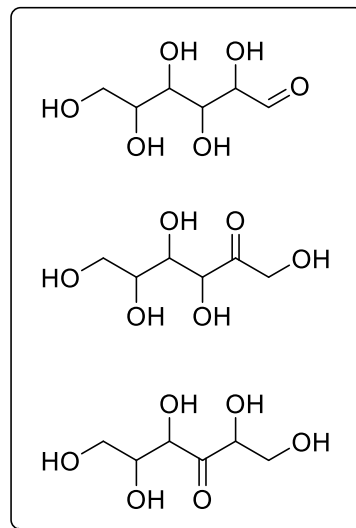
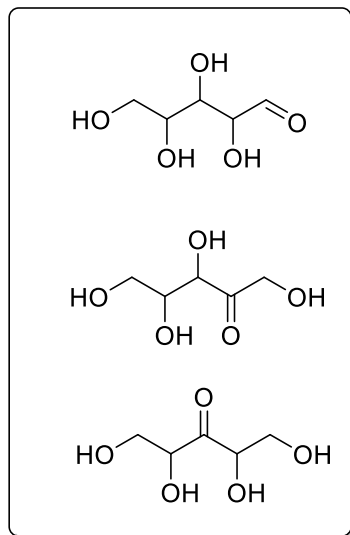
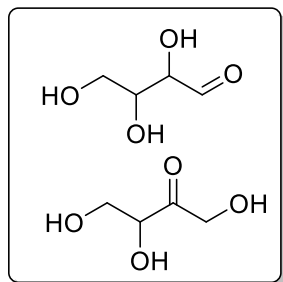
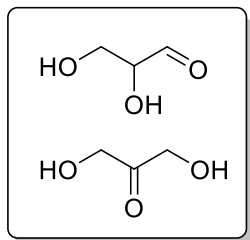


## Molecules with 3 stereogenic centers



---

## Sugars (CH<sub>2</sub>O)<sub>n</sub>



# Pentoses; how to convert zig-zag to Fischer projection

