# Tutorial N°3

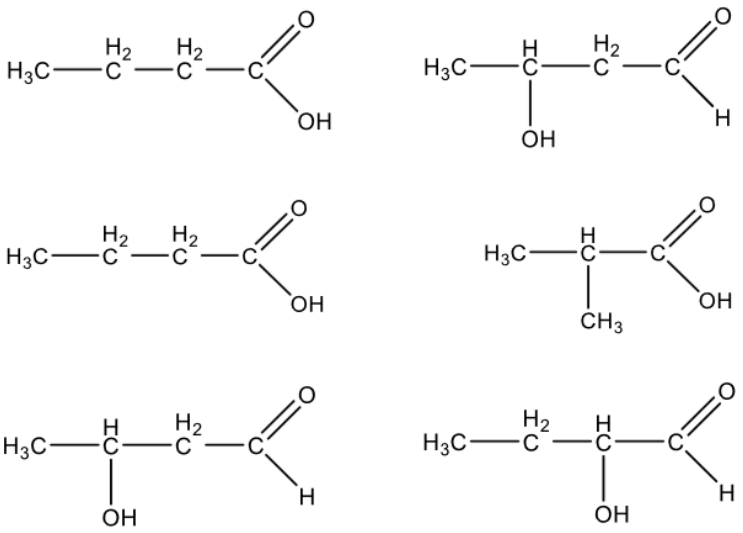
**Exercise 1 :**

Consider the molecule (CxHyOzNt) with a molar mass of 117.15 g/mol. The mass percentage of each constituent element of this molecule is given as follows : C = 51.26 % , H = 9.46 % , O = 27.32 % and N = 11.96 % .

Data : C : 12 g/mol , H : 1 g/mol , O : 16 g/mol , N : 14 g/mol.

- Find the molecular formula of the molecule.

**Exercise 2 :** What type of isomeric relationship exists between each pair of molecules ?



**Exercise 3 :**

For each molecular formula ($C_4H_8O$ and $C_4H_9ON$), suggest : - 02 chain isomers – 02 positional isomers - 02 functional isomers.

**Exercise 4 :**

Represent the following molecules using Cram, Newman and Fischer projections:

- 2,3-dichlorobutane.
- 2-hydroxypropanoic acid.

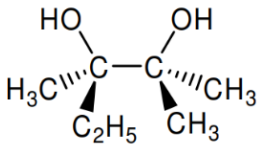
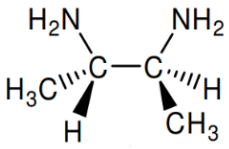
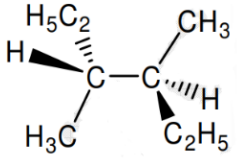
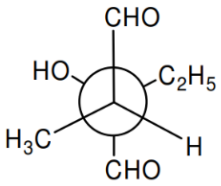
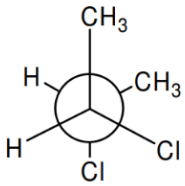
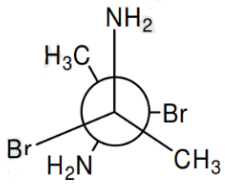
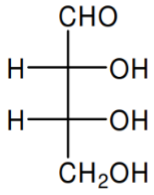
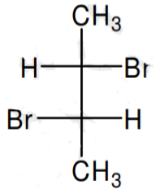
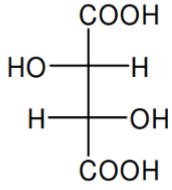
**Exercise 5 :**

According to the Cahn-Ingold-Prelog sequential rule, what is the order of priority of the following substituents ? :

a. –OH -$OCH_3$ -$CH_3$ -$CH_2OH$
b. -CN -$NHCH_3$ -$CH_2NH_2$ -$NH_2$
c. -COOH -$COCH_3$ -CHO -$CONH_2$
d. -$NH_2$ -SH -$OCOCH_3$ -$CCl_3$

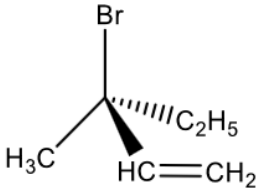
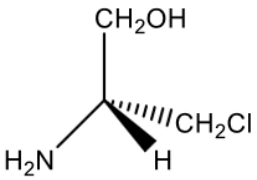
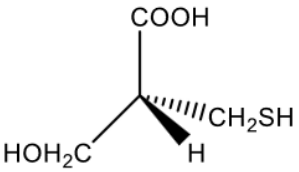
**Exercise 6 :**

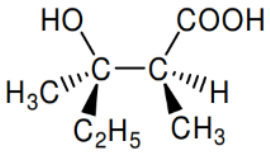
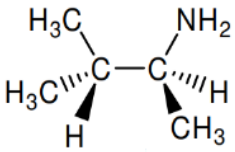
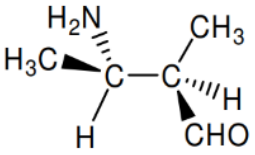
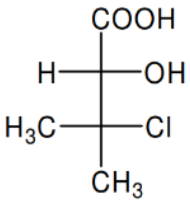
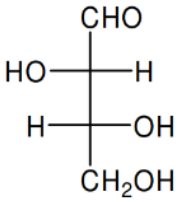
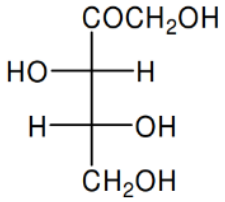
Which of the following molecules are chiral ?

**Exercise 7 :**

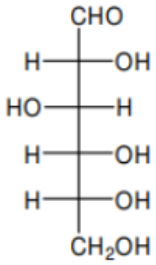
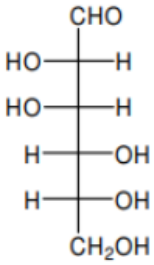
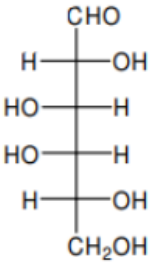
Determine the absolute configuration (R, S) of the asymmetric carbons in the following molecules:

**Exercise 8 :**

Consider the following 4C sugars. Give the absolute configuration of each asymmetric carbon. Are these three compounds enantiomers or diastereoisomers?

**Exercise 9 :**

Give the cis-trans and Z-E geometric stereoisomerism of the following molecules