First directed work of biochemistry

Chemical bonds

Exercise1 : Indicate which of these statements is (are) correct

Question 1 : Concerning the electronegativity of an atom:

- **a.** The electronegativity of an atom characterizes its ability to attract electrons when forming a chemical bond with another atom.
- **b.** The difference in electronegativity between two atoms determines the nature of the bond established between them.
- **c.** The electronegativity of elements in the periodic table decreases from top to bottom in columns and from right to left in rows.

Question 2 : Concerning strong bonds

- **a.** Covalent bonds are intramolecular bonds.
- **b.** The covalent bond is nonpolar when the difference in electronegativity is zero or small.
- **c.** The covalent bond is polar when the difference is average.
- **d.** An ionic bond is formed by the sharing of a pair of electrons between atoms. In homonuclear molecules the covalent bonds are polar.

Question 3 : Concerning weak bonds

- **a.** Van der Walls interactions are the strongest of the intermolecular bonds.
- **b.** Hydrophobic interactions are intermolecular bonds.
- **c.** Covalent bonds are a little longer than hydrogen bonds.

Exercise 2: Determine what type of bond will unite the various molecules below :

CO_2, H_2O, O_2, CH_4, NaCl

The electronegativities of the C, H, O, Na and Cl atoms are respectively 2,55 ; 2,2 ; 3,44 ; 0,93 et 3,16.

Exercise 3. Order the following bonds from least polar to most polar :

C-N, Li-F, H-H, O-H, C-C, S-O

The electronegativities of the C, H, O, N, Li, F and S atoms are respectively 2,55 ; 2,2 ; 3,44 ; 3,04 ; 0.98 ; 3.98 et 2,58.