

Series N° 6

Exercise 1:

1. Provide the Lewis representation for the following atoms and ions:

${}^4\text{Be}$, ${}^2\text{He}$, ${}^{13}\text{Al}$, ${}^8\text{O}$, ${}^{17}\text{Cl}$, ${}^{10}\text{Ne}$, ${}^7\text{N}$, ${}^{16}\text{S}$, ${}^{17}\text{Cl}^-$, ${}^{26}\text{Fe}^{2+}$.

2. Provide the Lewis representation for the following molecules:

Cl_2 , CO_2 , HCl , HCN , C_2H_2 , H_2SO_4 .

Exercise 2:

Calculate the dipole moment for the following two molecules:

Given:

$$\mu_{\text{CH}} = 0.4 \text{ D}, \mu_{\text{CO}} = 3.1 \text{ D}$$

Exercise 3:

Consider the N_2 molecule:

1. Provide the Lewis representation for this molecule.
2. Draw the energy levels (energy diagram) for this molecule.
3. Calculate the bond order.

Exercise 4:

What is the hybridization type of the carbon atoms in the following molecules?

CH_4 , HCN , CH_2O , CO_2 , C_4H_8 .