Answer on Question #72800 - Chemistry - General Chemistry

Question:

Calculate the number of electrons in p orbitals in 10.0g H7 -ion in the ground state.

Solution:

Find the amount of stuff for N_2:

$$n = \frac{m}{M} = \frac{10}{28} = 0.357 \; mol$$

We find the number of nitrogen (N) atoms in the molecule N_2:

$$N = n \cdot N_A \cdot 2 = 0.357 \cdot 2 \cdot 6.02 \cdot 10^{23} = 4.3 \cdot 10^{23} \, atoms$$

In one atom of N contains 3 electrons at p-orbitals, and in $4.3 \cdot 10^{23}$ atoms (10.0g N_2) a volumes then goes:

$$E = 4.3 \cdot 10^{23} \cdot 3 = 1.29 \cdot 10^{24} electrons$$

Answer: $1.29 \cdot 10^{24} electrons$