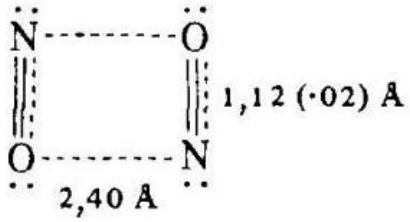
Nitric oxide and the structure of the benzene molecule.

Bezverkhniy Volodymyr Dmytrovych.

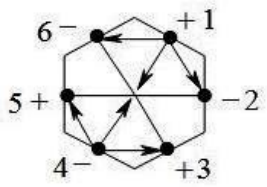
Ukraine, e-mail: bezvold@ukr.net

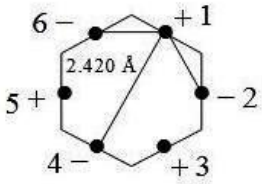
Nitric oxide (NO) is synthesized by almost all types of living organisms - from bacteria, fungi and plants to animal cells, and plays an important role in many biological processes. But, in addition, nitric oxide (NO) with its properties directly confirms the correct structure of the benzene molecule based on the theory of three-electron bonding. Let's explain what was said.

The fact is that the nitric oxide molecule has one unpaired electron. As a result, in the vapor state, the monomeric molecule of nitrogen oxide (NO) exhibits paramagnetic properties, and in the solid and liquid states it forms a dimer. Moreover, in the solid state, nitric oxide consists entirely of dimers, see photo [1]:



Note that in a dimer the distance between individual NO molecules (with unpaired electrons) is 2.40 angstroms. This distance practically coincides with the distance between interacting three-electron bonds in the benzene molecule, which we calculated earlier, and which is 2.42 angstroms [2].

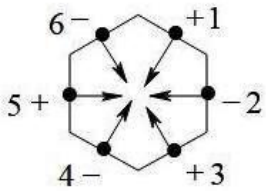




$L_{1-2} = L_{1-6} = 1.210$ Å

$L_{1-4} = 2.420$ Å

figure 4



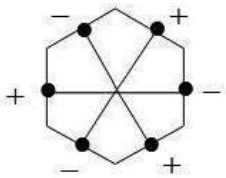


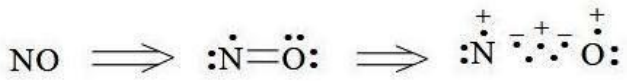
figure 5

That is, the dimer is formed from individual NO molecules that are located at a distance of 2.40 angstroms. This fact is a direct and irrefutable confirmation of the existence of a real interaction through the cycle in the benzene molecule. Since fermions interact at the same distance - 2.4 angstroms.

When an NO dimer is formed, the interaction between unpaired electrons will be weak, since this is a manifestation of intermolecular interaction (when a chemical bond is formed, a certain “saturation” of the chemical affinity of atoms occurs).

In the case of benzene, we have the formation of a chemical bond in the molecule, and therefore the interaction between unpaired electrons (or in general between fermions, for example between two three-electron bonds) will be much stronger, resulting in the C-C bond multiplicity in benzene increasing from 1.50 to 1.66 [2, p. 10].

Finally, we note that according to the three-electron bond theory, the nitric oxide molecule can be represented by the following formula [2, p. 28]:



Nitrogen monoxide, paramagnetic molecule

1. A. Wells. Structural inorganic chemistry. In three volumes. Moscow, “Mir”, 1987. Volume 2, p. 568.

2. Bezverkhniy V. D. Structure of the Benzene Molecule on the Basis of the Three-Electron Bond. SSRN Electronic Journal, Nov 2017. P. 4-5. https://dx.doi.org/10.2139/ssrn.3065241