Thematic Section: Theoretical Research. **Full Paper**
Subsection: Theory of the Matter Structure. *Reference Object Identifier* – ROI: jbc-02/17-51-7-1
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/
Submitted on Jule 21, 2017.

Shell structure of atoms

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Keywords: shell structure of an atom, dipole-shell model of atoms, electronic structure of atoms.

Abstract

The purpose of this paper is to study the electronic structure of atoms. The basis for these studies is the shell model of many-electron Bohr atoms. The inconsistency of the currently accepted quantum-mechanical model of the structure of atoms, constructed on the hypothesis of a non-existent wave function in nature, is shown. The development of a physically based Bohr model is the so-called dipole-shell model of many-electron atoms. An analysis of the experimental data on the polarizabilities and ionization potentials of atoms and ions made it possible to refine the existing ideas about the shell structure of atoms. It is shown that the shells are formed in accordance with the rule 2 + 4p, where p = 0, 1, 2, 3. Two-electron shells corresponding to p = 0 are fundamental. They form the skeleton of the atom, and their energy state is given by the quantum number n. The maximum number n is 7. From the two-electron shells, satellite 6, 10, and 14 electron shells bud. In this connection, the existing notions of 8, 18, and 32 electron shells should be clarified. In reality, these shells are compound – 8 = 2 + 6, 18 = 2 + 6 + 10, 32 = 2 + 6 + 10 + 14. The set of head two-electron shells and their satellites form compound two-, three- or four-layer structures. So atoms are a system of nested multilayer shells.

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