ABOUT THE FILLING WITH ELECTRONS
OF THE SUB-SHELLS IN MULTI-ELECTRON ATOMS

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Abstract: *In the framework of the Thomas-Fermi (statistical) model for neutral heavy atoms, in this paper we investigate the electronic structure of the atoms from the Mendeleev periodic table, namely the order of filling with electrons of various sub-shells of a shell. Because exact analytical solutions of the Thomas-Fermi equation do not exist, we will use three new approximate solutions compatible with the boundary conditions. With an old and well-known method, we investigate the electron distribution according to angular momentum, that is to say, we calculate the minimum value of the atomic number Z for which the filling of s- , p-, d- and f-state is possible in atoms. For one of the trial functions (with a good confidence-in our oppinion), the deduced values of the atomic number Z, at which a given value of orbital angular momentum (quantum number ℓ) can appear, are in good enough agreement with the reality (coinciding within several per cent).*