interaction energy in asymmetric complex plasmas in the poisson-Boltzmann approximation in the average spherical wigner-seitz cell and in the poisson-Boltzmann plus hole approximation [[1]](#footnote-1)\*)

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The authors consider a two-component equilibrium electroneutral system of classical macroions of finite size with the charge Z >> 1 and point oppositely charged microions with a unit charge in the Poisson–Boltzmann approximation in an average spherically symmetric Wigner–Seitz cell [1] and in the Poisson–Boltzmann plus hole approximation [2,3]. The second approximation is a modification of the Debye–Hückel plus hole approximation for a two-component system [4]. As a result of taking into account the effect of nonlinear screening, a method of all system microions approximate division into two types (free and bound ones) is proposed. A significant decrease of the effective macroion charge Z\* compared to the initial macroion charge Z is noted due to screening of bound microions by a dense sphere. In this work, the all system particles interaction energy [3] is calculated and the difference from earlier works [4, 5] is demonstrated. The results are used by the authors to calculate the free energy and pressure in the average spherically symmetric Wigner–Seitz cell.

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/Lt/ru/EB-Martynova.docx) [↑](#footnote-ref-1)