

# INTERACTION ENERGY IN THE POISSON-BOLTZMANN PLUS HOLE APPROXIMATION IN A HIGHLY ASYMMETRIC COMPLEX PLASMA

*Martynova I. A.,<sup>\*1,2</sup> Iosilevskiy I. L.<sup>1,2</sup>*

<sup>1</sup>*JIHT RAS, Moscow, Russia,* <sup>2</sup>*MIPT, Dolgoprudny, Russia*

*\*martina1204@yandex.ru*

The authors consider a two-component equilibrium electroneutral system of classical finite-sized macroions with the charge  $Z \gg 1$  and point oppositely charged microions with a unit charge in the Poisson–Boltzmann plus hole approximation [1, 2]. The second approximation is a modification of the Debye–Hückel plus hole approximation for a two-component system [3]. A method of all system microions approximate division into two types (free and bound ones) is proposed as a result of taking the effect of nonlinear screening into account. 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 [2] is calculated and the difference from earlier works [3, 4] is demonstrated.

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