

AVERAGE SIZE AND DENSITY OF CLUSTERS IN DUSTY PLASMA

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S u m m a r y

As is well known, metal and metal oxide dust particles either in combustion plasmas or in low-pressure gas-discharge plasmas are able to get a positive or negative charge. When the particles are identically charged, the Debye interparticle repulsion force arises. However, due to the additional interaction of grains with plasma electrons and ions, the resultant intergrain pair potential energy becomes non-Debye. As a result, it can cause local minima by certain plasma parameters. This case develops a quasimolecular structuralization, where two equally charged grains are spaced at a finite distance in equilibrium. The same principle of grain structuralization is valid for the multibody case where grains are associated in a crystal structure or clusters. The present work is devoted to the description of the dependence of the average size and the density of clusters on the interparticle potential. The general formula for the average cluster energy via the pair potential energy is derived.