

Abstract Submitted
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Like-charge attraction originated from intrinsic charge inhomogeneity YI ZHOU, ZHOUSHEN HUANG, TAI KAI NG, Department of Physics, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, HongKong — We study attractions between charged colloidal spheres in a solution and at a water-air interface. Both intrinsic inhomogeneous charge distribution and induced charge fluctuations may result in like-charge attraction. The intrinsic inhomogeneous charge distribution comes from the inhomogeneous surfaces of colloidal spheres, characterized by the number of patchy domains, while charge fluctuations occur in a homogenous background of charges. As the number of patchy domains increases, it will change from the intrinsic charge inhomogeneity to the induced charge fluctuation case. This crossover is studied theoretically and the results are compared with the recent experiments on polystyrene and silicon particles. A simple mechanism is presented to explain the enhancement of the attraction between two charged colloidal particles when they are suspended near a wall.

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