



Attractive interactions between equally charged nanoparticles in monovalent salts with different ionic size

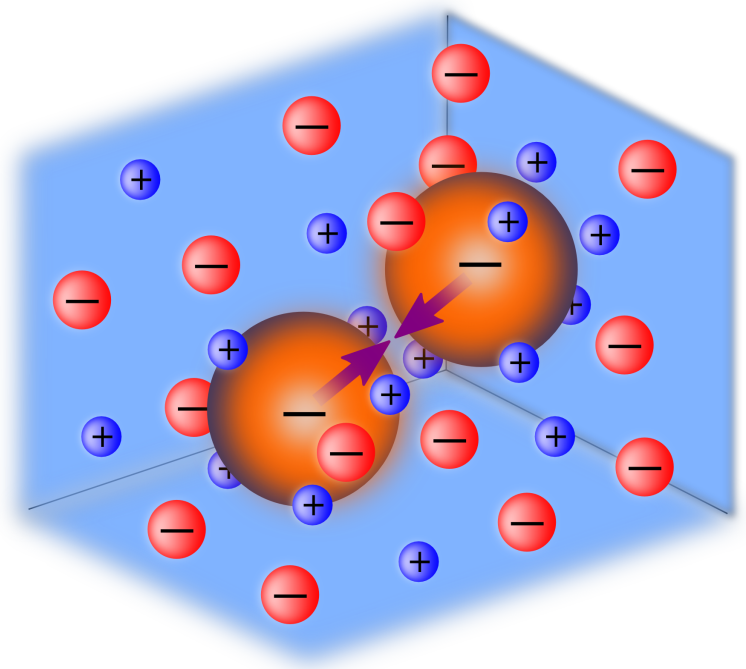


Guillermo Iván Guerrero-García¹, Pedro González-Mozuelos², and Mónica Olvera de la Cruz¹

¹ Department of Materials Science & Engineering, Northwestern University, Evanston, IL, USA

² Departamento de Física, Cinvestav del I. P. N., Av. Inst. Pol. Nal. 2508, D.F., México

The study of intermolecular forces among charged colloids in aqueous media is a topic of great relevance in physical chemistry due to the vast number of possible technological applications. In this work, the force between two identical charged nanoparticles in presence of an electrolyte with different ionic size was studied theoretically and via molecular simulations. An asymmetric behavior with respect to the colloidal charge polarity was found for the effective interactions between the nanoparticles. In particular, short-range attractions are observed between two equally and highly charged nanoparticles. This unexpected behavior could be relevant for colloidal stability applications, considering that our model does not include specific attractive interactions. These attractions are greatly enhanced for anionic nanoparticles immersed in standard electrolytes where cations are smaller than anions.



Attractive forces between two identical charged nanoparticles are observed in presence of a monovalent salt with different ionic size.

