Multiply charged colloids near the border of two media with different dielectric constants

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The electrostatic properties of multicharged colloids (so-called DLVO complexes; DLVO—Derjaguin–Landau–Verwey–Overbeek) near the interface between two media with different dielectric constants are discussed. It is shown that while remaining quasineutral in the DLVO electrolyte volume, colloids are partially charged near the $z = 0$ boundary separating these media. The problem of the interaction of an individual colloid with a solid seed nucleus $R_0 \gg a$ (a is the interatomic distance) and the charge $Q = Ze \gg 1$ (e is the elementary charge) with the metal-electrolyte interface is considered in detail. The task has a variety of applications in the diagnostics of DLVO complexes and in the practice of working with media that allow electric cut-off transport.