On Coulombic Phase Transitions in Model Plasmas

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Due to the large complexity of the transitions in real plasmas, the study of relatively simple model systems may give some further insight. We study here several model plasmas with respect to the existence of Coulombic phase transitions, as classical charged spheres, Deby-Hueckel-Saha plasmas, and combinations of Coulombic and van der Waals interactions. This way we come to a classification of several types of phase transitions of pure or mixed-type Coulombic character. We study in particular the degree of ionization in the neighborhood of the critical point and the coexistence line. It is shown that principal behaviour depends only on a small set of relevant physical parameters.