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Depletion interaction and effect of polydispersity in non-adsorbing polymer solutions¹ DADONG YAN, SHUANG YANG, C.C. HAN, State Key Laboratory of Polymer Physics and Chemistry, Institute of Chemistry, Chinese Academy of Sciences, Beijing 100080, China, AN-CHANG SHI, Department of Physics and Astronomy, McMaster University, Hamilton, Ontario L8S 4M1, Canada — The depletion effect between two spherical colloidal particles in non-adsorbing polymer solutions is investigated using the self-consistent field theory. The density distributions of polymer segments, the depleted amount and depletion potential are calculated numerically in bi-spherical coordinates. The effects of chain length, bulk concentration, and solvency are also investigated for the dilute regime, semidilute regime and high concentration. Also, the effect of polymer polydispersity on the depletion interaction between two plates immersed in a non-adsorbing polymer solution with Schulz molecular weight distribution is studied within self-consistent-field theory. For the case of two large spheres the Derjaguin approximation is used to study the effect of polydispersity.

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