## Accurate Modeling of Interfacial and Phase Equilibrium Properties of Reservoir Fluids with the soft-SAFT + DGT Approach

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The development of a consistent thermodynamic model capable of accurately describing the properties of both bulk and interfacial phases of reservoir fluids is of paramount importance for the deployment of more efficient reservoir engineering strategies. This include a proper evaluation of storage capacities, enhanced recovery plans and assessment of the quality and quantity of extracted fluids, to name but a few. In this communication, a theoretically sound approach has been used to describe simultaneously the bulk and interfacial properties of model reservoir fluids at relevant reservoir conditions. The examined approach combines the performance of a molecular-based equation of state, soft-SAFT EoS, with the extended Density Gradient Theory of van der Waals for interfaces, both fully established on statistical mechanics concepts. The required input parameters were obtained from vapor-liquid saturation properties and surface tension data of pure substances, and subsequently transferred for the description of mixtures. The adopted modeling approach has been successfully applied for the description of volumetric, phase composition, and interfacial property data of various hydrocarbon and aqueous systems as function of pressure, temperature, and composition. The systems examined here are relevant for a variety of applications, from wateralternating-gas injection schemes in the oil and gas industry to geological sequestration of CO2. In addition to interfacial tension, other interfacial properties such as density profiles, wetting transitions, interface thickness, and activity were also analyzed. The good agreement observed between calculations and experimental data confirmed the capability of our modeling approach for describing both bulk and interfacial behavior of reservoir fluids at relevant process conditions.