

Adsorption on Limestone and Interfacial Phenomena in Aqueous Media

Ghada Bassioni^{C, S}

The Petroleum Institute, Chemical/ Petroleum Engineering Departments, Abu Dhabi, United Arab Emirates

This study compares the results obtained for a wide range of substrates (small organic molecules and polymers bearing carboxylate anions) and their adsorption on limestone (industrial CaCO_3). Limestone is a mineral, which exhibits a basic character in non-aqueous systems, while a positive surface charge exists in aqueous media. Surface complexation occurs between the carboxylate groups of the molecules under investigation and hydrated calcium atoms located on the CaCO_3 surface exposed to the liquid phase. The charge density of the organic substrates is determined and correlated to the adsorption on CaCO_3 surface. Enthalpy studies confirm the dependence on the number of carboxylate anions and the molecular conformation. The results show that the suspension rheology changes according to these factors. Zeta potential measurements are performed on the CaCO_3 suspension containing the compounds under study and correlated to adsorption mechanisms.