Ion-Specific Effects and Adsorption Capacity of Ionic Surfactants with Simple Molecular Structure can be Predicted

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A simple procedure on predicting the adsorption capacity and the ion-specific effects of ionic surfactants has been suggested. The adsorption energy of the hydrocarbon tail has been calculated by means of the contributions from each methylene group, the hydrophilic head of the molecule and the number of the water molecules displaced from the Water/Air interface during the adsorption of one molecule. The contributions from different polar heads were tabulated. The contributions from the counter-ions were calculated by means of recently developed theory on the London interaction of one counter-ion with the Air/Water interface. The simple theory of Henry for adsorption of ionic surfactants was utilized for our particular task. Thus, one can tailor the adsorption properties of any ionic surfactants by having the structure of the hydrocarbon tail, the hydrophilic head and the type of the counter-ions.