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Prediction of the interficial tension for CO_2-Water/Brine binary system based on the linear fitting method

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Countries in the world now are trying best to conserve energy and reduce emissions, at the meantime, efficient actions are taken to tackle with global warming. Emission reduction of main greenhouse gas CO_2 can be achieved efficiently via CO_2 geological storage, in terms of CO_2 saline aquifer storage. The gas–liquid–solid interactions such as interfacial tension determines the injectability, sealing capacity and safety of this scheme. In order to better predict the storage capacity to evaluate the storage safety, this work aims at carrying out the numercial modelling work on the interfacial tension of CO_2–water/brine binary system under the reservoir temperatures and pressures condition.

A linear relationship between the increase in average interfacial tension and molality was observed and it is a function of the ionic type. Finally, modified empirical correlations based on experimental data in the literature, using only few regression coefficients with a relatively low error for most of the experimental data in the literature, were presented to estimate the CO_2–water/brinebinary system interfacial tensions under wide range of temperatures, pressures, and the ionic strength.

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