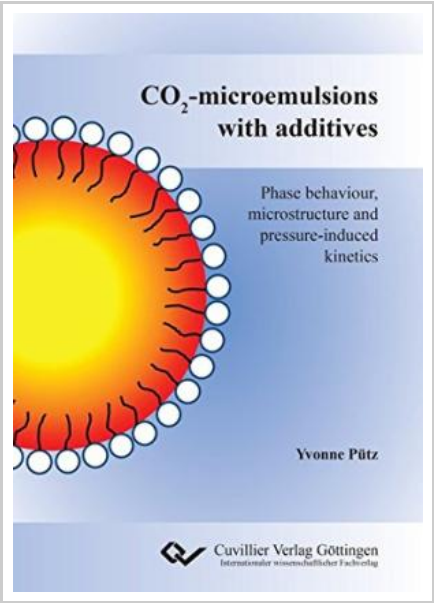

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CO2-microemulsions with additives

By Yvonne Pütz

Cuvillier Verlag Jul 2015, 2015. Taschenbuch. Book Condition: Neu. 212x149x17 mm. Neuware - Improved building insulation is an important part of today¿s efforts on energy saving. Here, nano-insulation materials promise especially low thermal conductivity. Therefore, an easy and cost-efficient production of these materials is an aim of present material research. One approach towards these materials is the expansion and fixation of polymerisable microemulsions of supercritical blowing agents. However, the nano-sized bubbles are found to undergo undesired coarsening processes. In order to reduce the increasing interfacial tension emerging during expansion and therewith the coarsening it was suggested to add low-molecular hydrophobic substances to the supercritical microemulsion. And indeed, the addition of cyclohexane to a microemulsion of the type brine - CO2 - fluorinated surfactants was found to reduce the fluorinated surfactant content - a measure for the interfacial tension - considerably. In this work a systematic small-angle neutron scattering (SANS) contrast variation was performed and the data were analysed by model-independent Fourier analysis. It was found that a concentration gradient of cyclohexane inside the CO2/cyclohexane microemulsion droplets forms. Interestingly, the analysis reveals a depletion zone close to the amphiphilic film which presumably develops due to the known repulsive interactions of cyclohexane...

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