

Effect of the Molecular Geometry on the Transient Foam Behavior of Binary Non-Aqueous Liquid Mixtures. Alkane + Alcohol, Alcoxyalcohol, Diol or Polyether Systems

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We are interested in the dynamic surface behavior for mixtures of linear, branched and cycled alkanes with alcohol and/or ether compounds formed by molecules with a linear, branched or cyclic structure. In this work we present results of the transient foam stability, measured with the Bikerman dynamic method, for some of the binary systems formed by an alkane a linear polyethers (dimethyl ethers of oligomers of ethylene glycol), cyclic polyethers (crown ethers) alcohol or diol. Experiments were done at different temperatures and throughout the concentration interval. Results were compared with previous liquid-liquid phase equilibrium and surface tension results. We found transient behavior for all studied systems with a maximum at, normally, the biggest change in the surface tension vs. composition slope. However, for the systems close to phase separation we found a maximum close to the critical phase separation composition which value is promoted on increasing the difference in pure surface tensions of the components. These results seem to imply that surface activity in non-aqueous systems is due mainly to closeness of phase separation more than a big reduction in surface tension. We try to explain our results in terms of surface compositions calculated via the Langmuir extended isotherm and the Pigogine-Marechal model of polymer solutions.