

# Microemulsions from anionic and non-ionic surfactants with a novel HIPE structure

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Many microemulsions from oil, water and non-ionic surfactants show two single-phase channels that pass with increasing temperature from the water phase continuously to the oil phase.

In contrast to this well-established behavior we have observed that microemulsions from mixtures of anionic and non-ionic surfactants show a different phase behavior. Such systems show only one optically isotropic channel, which passes from the water side to the oil side. The second channel begins at the  $L_1/L_o$  phase boundary and ends in the middle of the phase diagram with equal amounts of water and oil.

In addition a narrow liquid crystalline channel is observed for some of the systems that also passes continuously from the water side to the oil side.

The isotropic channel has a morphology that is however different from the morphology in non-ionic microemulsions. With increasing oil content the morphology changes from the morphology of a  $L_3$ -phase to the morphology of a HIPE structure in which the small oil fraction of as little as 6 % forms the continuous foam structure and the water is enclosed inside the foam structure.

With increasing oil content the viscosity in the channel passes over a high maximum at small oil fractions.