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SOLUBILITY OF FLUOROCARBONS IN WATER AS A KEY
PARAMETER FOR FLUOROCARBON EMULSIONS STABILITY

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Kinetics of particle size growth in emulsions of 12 fluorocarbons was studied by means of photon correlation spectroscopy. It was shown that a mechanism of emulsion coarsening with time was the Ostwald ripening, solubility of fluorocarbons in water (on the level of 10^{-6} - 10^{-11} ml/ml) being the key parameter for fluorocarbon emulsions stability. The solubilities of fluorocarbons in water were calculated from the Ostwald ripening kinetics data and the solubility-fluorocarbon structure relationship was established. In a homologous series of normal fluorocarbons the solubility in water decreased by a factor of 8.0 for each -CF₂- group. For a given carbon number, ring formation and branching increased water solubility of fluorocarbons. A correlation between fluorocarbon solubility in water and solvent cavity area [1] was found allowing one to predict the fluorocarbon emulsion stability from the structure of fluorocarbon.

1 R.B.Hermann, J.Phys.Chem.,76,2754(1972)