

NANOVOIDS IN THE FATTY- ACID TRIGLYCERIDES

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Size distribution of the nanovoids in the fatty-acid triglycerides is studied by means of the positron annihilation technique. Two types of the nanovoids are found: (i) the cages with the mean radius of 0,48 nm near the polar ends (glycerol moieties) of triglyceride molecules and (ii) the nanovoids between hydrocarbon chains, $(\text{CH}_2)_n\text{-CH}_3$. The radius of the latter is equal to 0,36 nm in thermodynamically equilibrium state of the triglycerides. This value coincides with the outer radius of C_{60} fullerene molecule. The positron penetrating to the interior of the nanovoids forms the bound state with electron (positronium atom). This indicates the presence of electric field at the nanovoid boundary and formation of the potential well for positively charged particles, such as the positrons, protons, and cations. The ordering of triglyceride molecules results in increased positron trapping probability by the nanovoid (by a factor of 2 to 3), which reaches 18 per cent and indicates the deepening of the potential well. Vice versa, the electron shell of the fullerene molecule forms the potential barrier for the penetration of positively charged particles into the interior. It is suggested, may lead to the formation of hybrid nanostructures with new properties.