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Investigation of behavior of water protons in close proximity to multi-walled carbon nanotubes coated by gemini surfactants

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The phenomena of water molecules relaxation process that takes place in close proximity to carbon nanotubes surface is crucial to designing modern contrast agents which are based on these structures. Shortening of relaxation times in very low magnetic fields is an effect of paramagnetic impurities in the CNT structures, as well as the degree of dispersion of nanoparticles in aqueous solution and type of the surface coating agent. The temperature may affect the surfactant's ability of self-assembly into more complicated structures on CNT surface, significantly modifying relaxation processes of water molecules. The aim of the studies is to verify usefulness of gemini surfactants, with different types of hydrophilic heads, length of spacer between them and length of hydrophobic alkyl chains. The surfactants have been chosen due to their amphiphilic character, because they may easily interact with hydrophobic nanotube's surface without significant influence on their electronic properties. Relaxation of water molecules has been investigated by fast field cycling nuclear magnetic resonance technique, in the wide spectrum of resonance field (10 kHz-12 MHz) and in variable temperatures.

Biography

Justyna Iżykowska, MSc, is a PhD candidate in Adam Mickiewicz University in Poznań, Poland. She is also a student of Optometry at the same university. Her scientific interests are self-assembly of polymers, subsurface phenomenon and nanotechnology. From 2016, she is the Contractor of the project of Polish Ministry of Science and Higher Education "Najlepsi zNajlepszycy".

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