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### A DLS study on the aggregation behavior of Pluronic F127 in presence of chitosan/clay nanocomposites

Although several researches have explored the dynamics of pluronic aqueous solutions under different conditions, little is known about the dynamical properties of pluronic copolymers in presence of nanoparticles. Knowing and understanding the fundamental dynamical behavior of such systems is crucial to optimize the formulation of high performance multifunctional structures. In the present work, dynamic light scattering (DLS) is used to investigate the temperature dependence of the dynamical properties of Pluronic F127 aqueous solutions in presence of intercalated chitosan/clay nanocomposites; for comparison, the pluronic aqueous solution and the binary systems pluronic/chitosan and pluronic/montmorillonite having the same copolymer concentration were also investigated. DLS results show that the pluronic solution is characterized by a fast and a slow diffusion process. The faster diffusion is associated with the unimers interchange between micelles whereas the slower one is ascribed to the presence of micellar clusters that undergo dehydration as the temperature increases. Starting from these observations, the dynamics of the pluronic-based/water systems was analyzed and, depending upon solution temperature, the observed decays were attributed to differently sized diffusive entities. The DLS findings give strong evidence for the coexistence of complex states of aggregation allowing us to get a better insight into the architecture of the investigated systems.

#### Biography

Prof Caterina Branca is currently an Associate Professor of Physics at the University of Messina. The research activity concerns essentially with the study of the structural and dynamical properties of soft condensed matter investigated by means of a wide class of techniques such as light and neutron scattering, photon correlation spectroscopy, etc. Currently, the research activity concerns with the synthesis and characterization of "smart" polymeric hydrogels and block copolymer micelles as novel carrier systems in the field of drug targeting. Prof Branca is author of about 90 articles published in international peer-reviewed journals in addition to numerous conference proceedings.

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