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Fabrication of carbon fullerene based hard disk unit

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We prepared nanostructured films in different thicknesses of fullerenes C₆₀ by assembling 1 to 3 monolayers by means of Langmuir-Schaefer technique. We obtained the stock solutions by dissolving the fullerenes C₆₀ in toluene and then spreading at the air/water interface. The study of pressure-area isotherms showed a surface pressure of 40 mN/m as the best value for the deposition of monolayers. We also used the isotherms to determine the area per molecule parameter during the compression process; at the condensation point on packaging the C₆₀ molecules we reached a value of 50 Å²/molecule, highlighting the formation of agglomerates of fullerenes upon compressing. We deposited monolayers on different substrates and characterized both the conductivity and by electron microscopy FESEM the morphology minimizing cluster formation of fullerenes C₆₀ nanoassembled; this with the objective to construct hard disk units presently in progress (pending patent application), taking advantages of the “monomolecular” non conducting properties of fullerenes for using such molecules as single cell transistors.

Biography

Claudio Nicolini was born in Udine, Italy. He received the doctoral degree in physics from the University of Padua, in 1967. After serving as Adjunct Professor at the University of Bari, he moved for 17 years to the United States, of which he became citizen since 1974, and was originally at Brown University, MIT, and BNL. He then moved to Temple University School of Medicine, Philadelphia, where after a period of intensive training and research in pathology he became Associate Professor of Pathology and then Professor and Chairman of the Biophysics in 1976. In 1985, he was called as “eminent scientist” to the Chair of Biophysics of the University of Genoa, in Italy until 2012, where he was successively Director of Biophysics Institute, DISTBIMO and CIRSDNNOB. From 1993 until now is Life President of the Fondazione ELBA Nicolini and of the Nanoworld Institute. On 2008 has been elected as a Foreign Member of the Russian Academy of Sciences and on 2010 *Honoris Causa* Professor of Biophysics and Nanobiotechnology at Moscow State University. He was Chief Editor of Cell Biophysics (USA), Science and Technology Advisor to Italian Prime Minister Craxi, Member of the National Science and Technology Council upon Parliament election, Scientific Director Industrial Consortium CIREF, Founder Technobiocip; President Polo National Bioelectronics, President Scientific Technological Park of Elba Island. He received several awards and prizes and has authored more than 480 publications in international scientific journals (SCI), 35 patents (WPI), 28 books and Series Editor in Bioelectronics (Plenum) and Nanobiotechnology (Pan Stanford). His main scientific activities concerned cancer research, biophysics and nanotechnology, pioneering world-wide chromatin structure-function, bioelectronics and nanobiotechnology.

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