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Light-Emitting Colloidal Nanostructures: Material- and Application-Related Aspects

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Abstract

There has been tremendous progress in the development of light-emitting colloidal nanomaterials, starting from the traditional semiconductor quantum dots, and moving on to novel materials, such as carbon dots, metal nanoclusters and lead halide perovskites. I will provide an overview of these light-emitting colloidal nanostructures, which have been recently synthesised in our laboratories, and highlight the correlation between the structural characteristics of carbon dots and perovskite nanocrystals, including their optical properties which were studied by advanced optical spectroscopy techniques. I will further demonstrate their emerging applications in luminescence nanothermometry, light-emitting devices and liquid crystal displays.

Biography

Professor Andrey L. Rogach is a Chair Professor of Photonic Materials at the Department of Materials Science and Engineering, and the Founding Director of the Centre for Functional Photonics at the City University of Hong Kong. He received his PhD in Chemistry (1995) from the Belarusian State University in Minsk, Belarus, and worked as a staff scientist at the University of Hamburg (Germany) from 1995 to 2002. From 2002 to 2009, he was a lead staff scientist at the University of Munich (Germany), where he completed his habilitation in experimental physics. His research focuses on the synthesis, assembly and optical spectroscopy of colloidal semiconductors and metal nanocrystals, and their hybrid structures, including their use for energy-related applications.

He has authored over 350 scientific publications (Google Scholar h-index: 105) in these fields which have been extensively cited (over 38,000 times). This has ranked him 51st worldwide among the "100 TOP MATERIALS SCIENTISTS OF THE PAST DECADE" by *Thomson Reuters* (2011). He holds honourable appointments as an Adjunct Professor at Trinity College Dublin (Ireland) and the University of Electronic Science and Technology of China, and as an Honorary Professor at Xi'an Jiaotong University, Jilin University and Peking University. He is also a Visiting Professor at Nanyang Technological University, Singapore. In addition, Professor Rogach is a Fellow of the Electromagnetic Academy (USA) and serves as an Associate Editor of *ACS Nano*.