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Controlling surface plasmon propagation and exciton-plasmon coupling

Hong Wei

Chinese Academy of Sciences, China

The coupling of light to surface plasmons (SPs), the collective oscillations of electrons on metal surface, makes it possible to miniaturize photonic devices beyond diffraction limit of light and enables the manipulation of light-matter interaction at the nanometer scale. Chemically synthesized Ag nanowires (NWs) with crystalline structures and smooth surfaces are excellent waveguides that support propagating SPs, and can be easily manipulated to construct complex optical devices, which make them ideal candidates for proof-of-principle studies for plasmonic circuits. Moreover, surface plasmons provide the ability to enhance the weak interaction between individual quantum emitters and photons for quantum information applications. The generation of single plasmons by coupling Ag NW with single quantum emitters opens the prospects of using quantum optical techniques to control single SPs and designing novel quantum plasmonic devices. Here we study the controllable SP propagation in Ag NWs and the coupling between a Ag NW and individual quantum dots.

Biography

Hong Wei has completed her PhD in 2009 from Institute of Physics, Chinese Academy of Sciences (IOP, CAS). She is now an Associate Professor in IOP, CAS. Her research interests are focused on surface-enhanced spectroscopy, plasmonic waveguides and circuits, interactions of surface plasmons and excitons.

weihong@iphy.ac.cn

Which and how many small molecules can be inserted into fullerenes and a nanotube?

Helena Dodziuk

Polish Academy of Sciences, Poland

The discovery of C_{60} and their studies abound in sudden twists like a detective story. Its first endohedral complex was observed in the same ⁶⁰ year when the fullerene was discovered. Few years later an "application rush" begun with proposals of all kinds of exciting and strange applications. However, few of them were commercialized. Numerous calculations on the endohedral complexes involving hydrogen were published with the number of the molecules inserted into the cage ranging from one to 29 although model considerations show unequivocally that only one of them can be hosted by the C_{60} cage. The SAPT calculations for complexes involving several guest molecules in C_{60} and C_{70} will be discussed together with those on a $C_{50}H_{10}$ nanotube with several guests inside as well as model calculations of chiral recognition by C_{82} .

Biography

Helena Dodziuk has pursued her MSc in Physics at the age of 22 years from Warsaw University, PhD from Institute of Organic Chemistry and DSc from Wrocław University. She has authored or edited four books ("*Modern Conformational Analysis; Elucidating Novel Exciting Molecular Structures*", VCH Publishers, NY, 1995; "*Introduction to Supramolecular Chemistry*", Kluwer, Dordrecht, 2002; "*Cyclodextrins and Their Complexes. Chemistry, Analytical Methods, Applications*", Wiley-VCH, Weinheim, 2006; "*Strained Hydrocarbons. Beyond van't Hoff and LeBel Hypothesis*" with a foreword by Roald Hoffmann, Wiley-VCH, Weinheim, 2009, published more than 100 papers in reputed journals as well as several popularization articles and presentations.

dodziuk10@vp.pl