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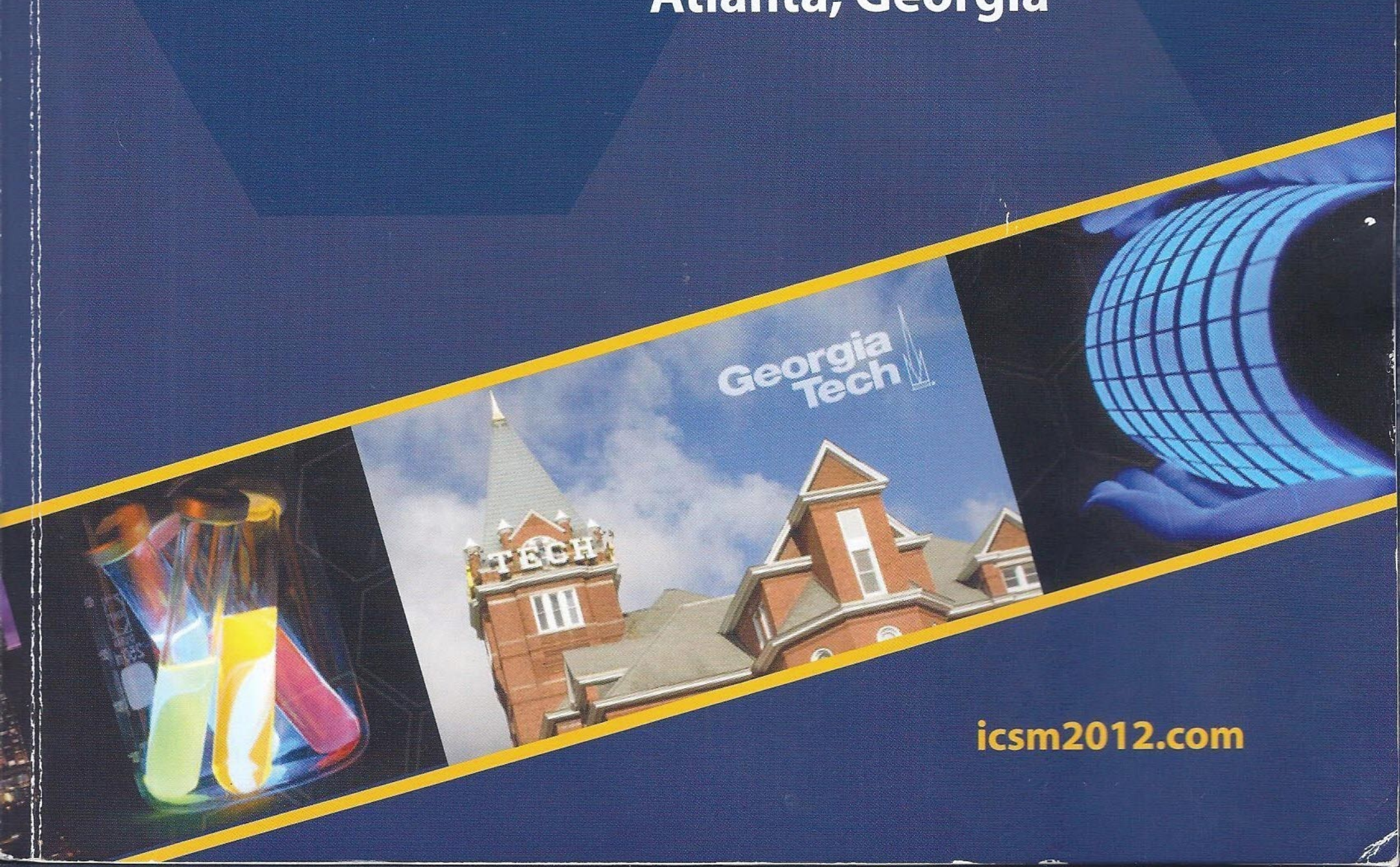

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ST-135

POLYDIOXYTHIOPHENE NANODOTS, NONOWIRES, NANO-NETWORKS, AND TUBULAR STRUCTURES: THE EFFECT OF FUNCTIONAL GROUPS AND TEMPERATURE IN TEMPLATE-FREE ELECTROPOLYMERIZATION

Hsiao-hua Yu

Yu Initiative Research Unit RIKEN Advanced Science Institute
2-1 Hirosawa, Wako, Saitama, 351-0198 (Japan)
bruceyu@riken.jp.

Various nanostructures, including nanofibers, nanodots, nano-network, and nano to micro size tubes, of functionalized poly(3,4-ethylenedioxythiophene) (EDOT) and poly(3,4-propylenedioxythiophene) (ProDOT) are created by using a template-free electropolymerization method on indium-tin-oxide substrates. By investigating conducting polymer nanostructures containing various functional groups prepared at different polymerization temperature, we conclude a synergistic effect of functional groups and temperature on the formation of polymer nanostructures when a template-free electropolymerization method is applied. The copolymerization of different functionalized EDOTs may cause irregular and unexpected nanostructures, which indicates the complex interaction between different functionalized monomers during the electropolymerization.

ST-136

QUANTUM DOTS AND ORGANIC HYBRID NANOSTRUCTURES; NANOSCALE OPTICAL AND ELECTRICAL CHARACTERISTICS

J. Joo[1], Y. B. Lee[1], S. H. Lee[1], Y. D. Han[1], S. M. Lee[1], S. Y. Park[2], K.-S. Lee[2], J. Kim[3]

[1] *Department of Physics, Korea University, Seoul 136-713 Korea,*
jjoo@korea.ac.kr
[2] *Department of Advanced Materials, Hannam University,Daejeon 305-811, Korea*
[3] *Department of Physics, University of Incheon, Incheon 406-772, Korea*

Light-emitting poly(3-hexylthiophene) (P3HT) nanowires (NWs) were hybridized with functional CdSe/ZnS core-shell quantum dots (QDs). Nanoscale photoluminescence (PL) of hybrid nanostructures was investigated using laser confocal microscope (LCM). In a single P3HT/QDs hybrid NW, the LCM PL intensity corresponding to P3HT NW considerably increased, while that corresponding to the QDs decreased, because of Förster energy transfer effect. We demonstrate that nanoscale PL characteristics of both polymer NW and QDs can be controlled through the hybridization conditions. Hybrid NWs consisting of P3HT, PCBM, and CdSe/ZnS QDs were synthesized. With hybridization of QDs, the photo-induced electrical characteristics of the P3HT/PCBM NWs are discussed.