Xie Linghai, Organic Chem Curr Res 2017, 6:2 (Suppl)
DOI: 10.4172/2161-0401-C1-019

The discovery of one-pot protocol to synthesize spiro[n]arenes

Xie Linghai
Nanjing University of Posts and Telecommunications, China

Four-element theory of Matter-Energy-Information-Consciousness (MEIC) guide human being to enter the era of consciousness (EOC) that will make service abundant extremely, resulting in the achievement of socialism and communism. Toward EOC, the surface-equal-device engineering is necessary to make the matter or objects smart that require the universe semiconductor materials. In order to make optoelectronic materials available easier, we always focus on the carbon-based organics for the investigation on the cycle of molecular systems and organic devices by means of the feature of diversity, flexibility and multiscale hierarchy. In the past decade, we discovered and established a facile one-pot protocol to synthesize the spiro[n]arenes and spirofluorenes with an orthogonal and cross-shaped configuration. The high-yield cascade tandem reaction makes Spirofluorene Xanthene (SFX) with low-cost, Pot-Atom-Step Economic (PASE) procedure. SFX-based chemistry has been conducted with various C-C or C-X coupling reaction to establish a diverse platform of bulky semiconductors for Organic Light-Emitting Diodes (OLEDs), transistor memory and perovskite solar cells, etc. Non-doped deep-blue SFX-based semiconductor was successfully prepared and adopted in OLEDs with External Quantum Efficiency (EQE) of 4.1%. Simultaneously, SFX-based host (SFXSPO) with a promising EQE of 22.5% was achieved in the corresponding thermally activated delayed fluorescence dives. Additionally, we have prepared SFX-based semiconductor (TTMeODPA-SFX) as hole-transporting material for perovskite solar cells (PSCs) and achieved improved power conversion efficiency of 12.94% and open-circuit photo-voltage of 1.00 V.

Biography

Xie Linghai is a Professor of Organic/Polymer Materials Chemistry at Nanjing University of Posts and Telecommunications (NUPT). He obtained his PhD from Fudan University in June 2006. After this, he joined Nanjing University of Posts and Telecommunications (NUPT) and became a Leader of the Center for Molecular Systems and Organic Devices (CMSOD@IAM). He won the NSFC award for Excellent Young Scholar in 2013. His research activities focus on molecular installing technology (MIT), synergistically molecular attractor-repulsor theory (SMART), polygrid based nanopolymer wide-bandgap semiconductors, organic electrets for memories and memristors. He has published more than 150 papers in reputed journals and has been cited by more than 2000.

iamlhxie@njupt.edu.cn

Notes: