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Controlling Growth of Molecular Aggregates with Distinct Linear and Nonlinear Optical Properties

Yongjun Li* and Yusen Luo

Beijing National Laboratory for Molecular Sciences (BNLMS), CAS Key Laboratory of Organic Solids, Institute of Chemistry, Chinese Academy of Sciences, P. R. China

Two novel donor–acceptor molecules, 2, 7-diphenylbenzo[1, 2-b:4, 3-b']difuran-4, 5-dicarbonitrile and 2, 7-bis(4-methoxyphenyl)benzo[1, 2-b:4, 3-b']difuran-4, 5-dicarbonitrile containing cyano group as the electron acceptor, were synthesized. Their single-crystal structures, molecular packing, and self-assembly behaviors were also investigated. By simple solvent evaporation techniques, these compounds self-assemble into various low-dimensional microstructures that demonstrate distinctive nonlinear optical properties depending on the orientations of their transition dipoles. This study highlights the importance of the transition dipole moment in the construction of low-dimensional molecular materials with highly efficient nonlinear optical properties.

Biography:

Yongjun Li was born in 1975 in Sichuan, China. He received his Master degree in Chemistry from Sichuan University in 2001, and he earned his Ph.D. in organic chemistry in 2006 at ICCAS. He is currently a Professor at the Institute of Chemistry, Chinese Academy of Sciences. He has published more than 100 peer reviewed scientific articles and invited reviews in the journals, such as *Nat. Commun.*, *Acc. Chem. Res.*, *Chem. Soc. Rev.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed. et al.*. His research interests lie in the fields of design and synthesis of functional organic molecules.