Supplementary material (ESI) for Journal of Materials Chemistry


# Supporting information

# Investigations and facile synthesis of a series of novel multi-functional two-photon absorption materials

**Yu-Peng Tian *[a, b], Lin Li [a], Ju-Zhou Zhang [a], Jia-XiangYang [a, b], Hong-ping Zhou [a], Jie-ying Wu [a], Ping-ping Sun [a], Li-min Tao [c], Ya-hui Guo [c], Chuan-Kui Wang [c, d], Hui Xing [e], Wen-hao Huang [e], Xu-Tang Tao [b] and Min-Hua Jiang [b]**

[a]*Department of Chemistry, Anhui University, Hefei 230039, P. R. China*

[b]*State Key Laboratory of Crystal Materials, Shandong University, Jinan, 250100, P. R. China*

[c]*Department of Physics, Shandong Normal University, Jinan 250014, P. R. China*

[d]*Laboratory of Theoretical Chemistry, Royal Institute of Technology, SCFAB, S-10691 Stockholm, Sweden*

[e]*Department of Precision Machinery and Precision Instrumentation University of Science and Technology of China, Hefei, 230026, P. R. China*

Fax: (+86)551-5107342
E-mail: yptian@ahu.edu.cn

**Chemicals:** Tripenylamine, 4-vinylpyridine (95%), 2-vinylpyridine (95%), PMMA (polymethylmethacrylate) and palladium (II) acetate (47.5% Pd) were purchased from Acros Organics. Ethoxylated biphenolA diacrylate, SR 349, was used as purchased form Sartomer, USA.

Mercury (II) oxide yellow, iodine, acrylonitrile, methyl acrylate, butyl acrylate triphenyl- phosphine, ethyl acetate, petroleum ether (60~90), N,N-dimethylformamide, dichloromethane and other solvents were purchased from

Shanghai Chemical Reagent CO., LTD. The chemicals used were of analytical grade. The solvents were purified by conventional methods before use.

**Measurements.** Elemental analyses were performed with a Perkin-Elmer 240B instrument; IR spectra were recorded with a Nicolet FT-IR NEXUS 870 instrument (KBr discs) in the 4000-400 $cm^{-1}$ region. $^1H$ NMR spectra were obtained on a Bruker Avance 600 MHz spectrometer in DMSO-$d_6$ solution (with TMS as internal standard). Electrospary Ionization Mass Spectrum (ESIMS) were acquired by a model LCQ ion trap mass spectrometer (Finnigan) equipped with a Finnigan MAT electrospray ion source. Mass spectrum was determined with a Micromass GCT-MS (EI source). Electronic spectra were recorded on a UV-265 spectrophotometer. The one-photon fluorescence spectra measurement is performed with use of a Shimadzu RT-5301PC Spectro-fluorophotome. Spectra are recorded between 400 and 700 nm using a photomultiplier tube as detector. The TPEF spectra were measured using a mode-locked Ti: sapphire laser (Coherent Mira900F) as pump source with pulse duration of 200fs, a repetition rate of 76 MHz, and a single-scan streak camera (Hamamastu Model C5680-01) together with a monochromator as the recorder. The set-up for TPEF measurements is shown in Fig. 6. The TPIP experiments were carried out on the same mode-locked Ti: sapphire laser as that used in the two-photon fluorescence measurements (Fig. S1). It provided the 780 nm lasing source which was tightly focused *via* an objective lens (NA = 0.65), and the focal point was focused on the xy-step monitorized stage controlled by computer.

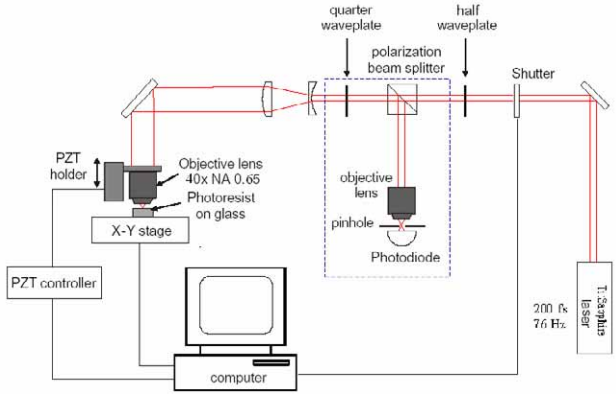


**Fig. S1.** Experimental setup for two-photon photopolymerization and optical data storage.