

Supporting Information

Tetraphenylethylene @ Graphene Oxide with Switchable Fluorescence Triggered by Mixed Solvents for the Application of Repeated Information Encryption and Decryption

Mengmeng Qin,^{,†,‡,§} Yuxiao Xu,[†] H. Gao,[⊥] Guoying Han,[†] Rong Cao,[†] Peili Guo,[†] Wei Feng,^{*,‡} and Li Chen^{*,†,‡,§}*

[†]School of Materials Science and Engineering, Tianjin University of Technology, Tianjin 300384, P. R. China

[‡]Tianjin Key Laboratory for Photoelectric Display Materials and Devices, Tianjin 300384, China

[§]Key Laboratory of Photoelectric Display Materials and Devices, Ministry of Education, Tianjin 300384, P. R. China

[‡]School of Materials Science and Engineering, Tianjin University, Tianjin 300072, P. R. China

[⊥]School of Chemistry and Chemical Engineering, Tianjin University of Technology, Tianjin 300384, P. R. China

Corresponding Authors

*Mengmeng Qin, E-mail: qmm@tju.edu.cn

*Wei Feng, E-mail: weifeng@tju.edu.cn

*Li Chen, E-mail: chenli@tjut.edu.cn

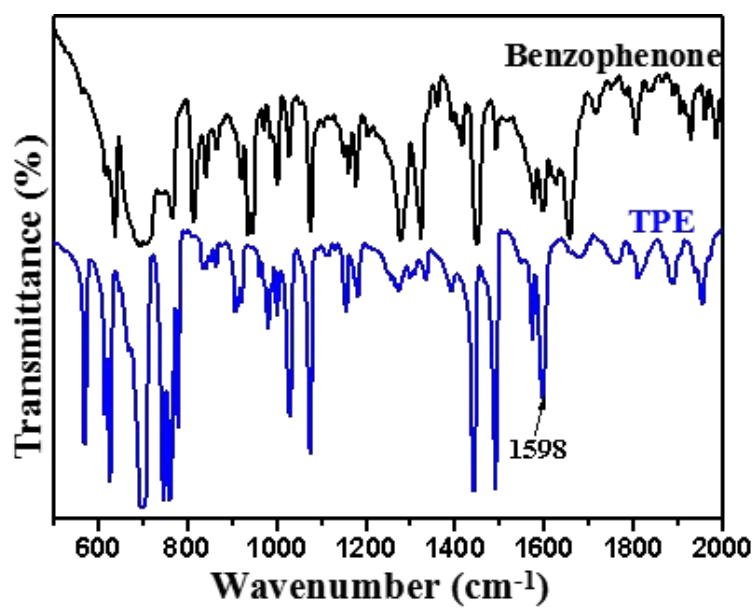


Figure S1. FTIR spectra of TPE and Benzophenone.

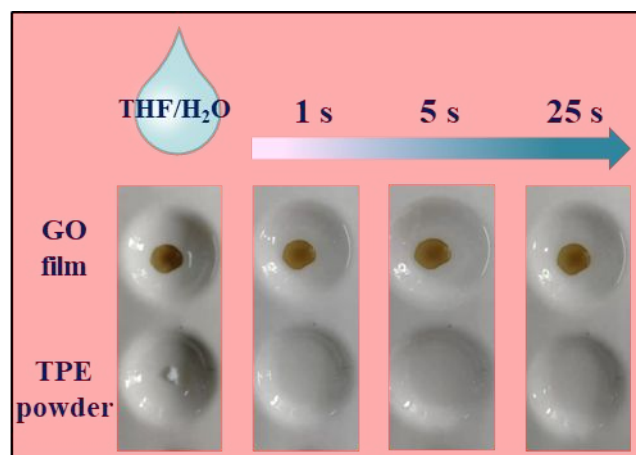


Figure S2. The dispersibility of GO film and TPE powder in THF/H₂O ($V_{\text{THF}} = 60\%$).

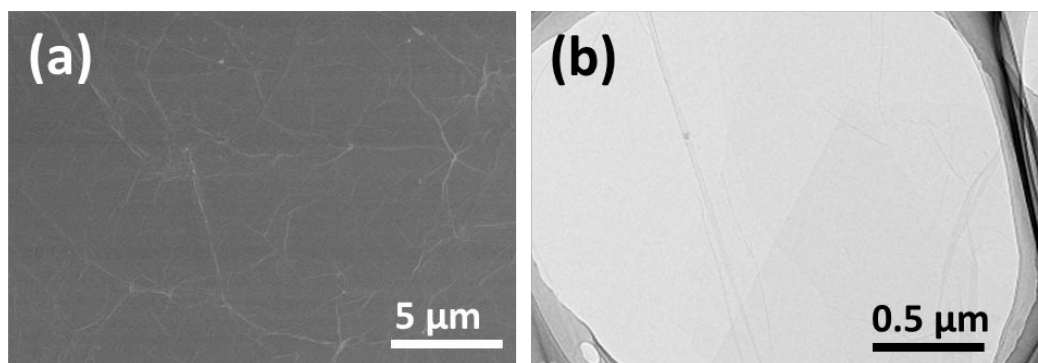


Figure S3. (a) SEM and (b) TEM images of GO.

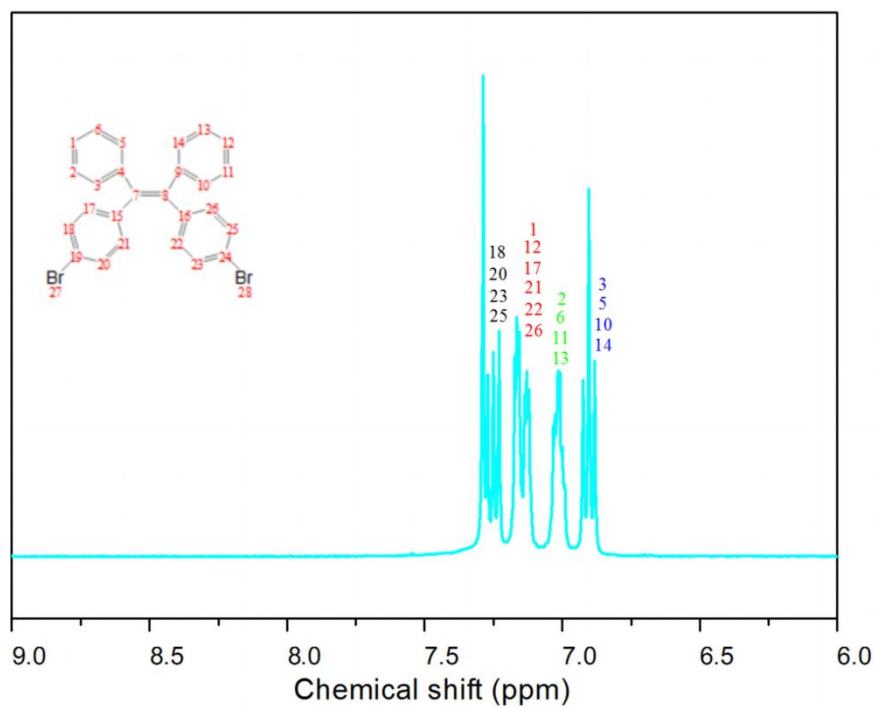


Figure S4. ¹H NMR spectrum of TPEDBr in CDCl₃.

δ (ppm):

7.28-7.22 (m, 4H; Ar H)

7.18-7.10 (m, 6H; Ar H)

7.04-6.98 (m, 4H; Ar H)

6.93-6.89 (m, 4H; Ar H)

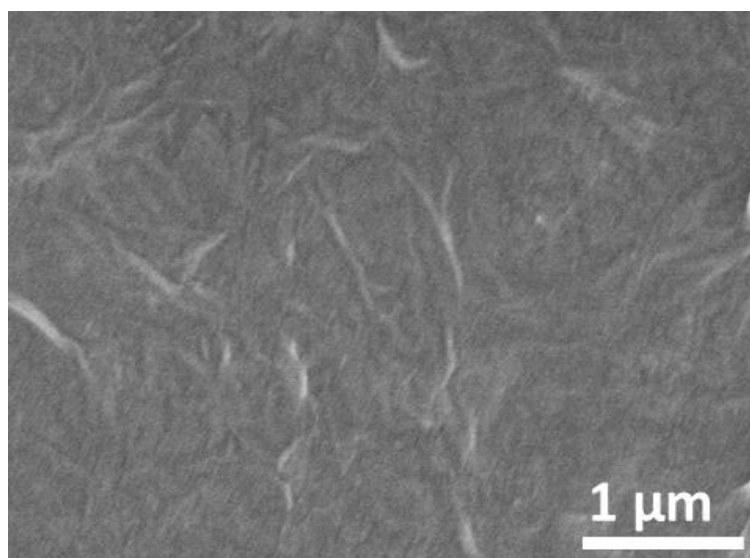


Figure S5. SEM image of TPE@GO (No. 2) treated with DMF/H₂O.

The evolution of peak-forest is a very complex process including the CaCO₃-H₂O-CO₂ interactions.^{1,2} The commonly reported evolution process mainly includes two stages. Firstly, seawater containing much CO₂ could react with Ca²⁺ to give CaCO₃, which was finally deposited in the seabed and formed the limestone over a long period. Secondly, due to the crustal movement, the seabed evolved into dry land, and the limestone could form the peak-forest during the etching of rainwater containing CO₂.

[1] Tang, T.; Day, M., Field survey and analysis of hillslopes on tower karst in Guilin southern China. *Earth Surface Processes and Landforms* **2000**, 25, 1221-1235.

[2] Liu, Z.; Groves, C.; Yuan, D.; Meiman, J.; Jiang, G.; He, S.; Li, Q., Hydrochemical variations during flood pulses in the south-west China peak cluster karst: impacts of CaCO₃-H₂O-CO₂ interactions. *Hydrological Processes* **2004**, 18, 2423-2437.