<Supporting Information>

Insight into the interactions between pyrene and polystyrene for efficient quenching nitroaromatic explosives

Hyun-Sook Jang, ^{1,2*}, Hyun-Seok Cho³, David Uhrig⁴, Mu-Ping Nieh^{2,5,6}

- 1. Center for Soft and Living Matter, Institute for Basic Science (IBS), Ulsan 44919, Republic of Korea
- 2. Polymer program, Institute for Materials and Science, University of Connecticut, Storrs, CT, 06269, USA
- 3. Hydrogen Laboratory, New & Renewable Energy Department, Korea Institute of Energy Research, Daejeon, Republic of Korea
- 4. Center For Nanophase Materials, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA
- 5. Department of Chemical and Biomolecular Engineering, University of Connecticut, Storrs, CT, 06269, USA
- 6. Department of Biomedical Engineering, University of Connecticut, Storrs, CT, 06269, USA

Corresponding author: Hyun-Sook Jang Telephone: +82-10-3859-9275, E-mail: hs84.jang@gmail.com

This supporting information contains UV-vis absorption spectra, time-dependent fluorescence emission spectra of various Py/PS films, quenching efficiency in presence of a variety of explosive molecules and UV-vis absorption spectra of Py/PS as a function of PS MW.



Figure S1. The dependence of different thicknesses of Py/PS films on the Py/PS concentrations with different Mw_s .



Fig. S2. Fluorescence spectra (excited at 350 nm) of 3-component Py/PS/TBAPF₆ films prepared at room T with different salt compositions, 63wt % (black), 45wt% (blue), 27wt% (red), and 13wt% (green), respectively. The I_{exc} is located around 466 ± 2 nm from ref [18].



Figure S3. (A) UV-vis absorption (solid lines) and fluorescence spectra (dotted lines) of Py (blue) and PS (black) (B) The UV-vis absorption (solid lines) and fluorescence spectra (dotted lines) of PS (orange), 2,4-DNT (blue) and Py/PS (green). The little or no overlapping range of Py/PS emission with 2,4-DNT absorption was shown.



Figure S4. The time-dependent fluorescence quenching efficiency in the presence of 2,4-DNT of (A) Py/PS films (thickness: 550 ± 60 nm) (B) Py/PS films (thickness: 110 ± 40 nm) of different PS architecture (linear, centipede and 4-arm star), respectively.



Figure S5. The UV-vis absorption spectra of Py/PS films before and after exposed to 2,4-DNT. The PS has different molecular architectures, noted as PS1, PS2 and PS3. (PS1: linear PS, PS2: Centipede, PS3: 4-arm star). The onset points of UV-vis Abs spectra obtained from different samples are similar to each other.



Figure S6. Time-dependent fluorescence emission spectra of Py/PS films composed of PS with different molecular architectures in the presence of 2,4-DNT. (a), (b) are the results obtained from the 550 nm thick film while (c)-(e) represents results from the 110 nm thick films. The invariance of the peak positions during the quenching process represents no clear change in the band gap.

(a) centipede-PS (500K)/PS thickness = 550 nm

(b) 4 arm-star-PS (500 K)/PS thickness = 550 nm