

Abstract Submitted
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How the structures of salts involve in the optical properties of Pyrene (C₁₆H₁₀)? HYUN-SOOK JANG, Institute of Materials Science, University of Connecticut, JING ZHAO, Department of Chemistry, University of Connecticut, MU-PING NIEH, Institute of Materials Science, Dept. Chem. & Biomol. Eng., University of Connecticut — Pyrene (Py), due to its specific optical properties (i.e., long life time, excimer, polarity), has been used as a variety of sensors. It has reported that the high vapor pressure in processing the films is an important factor for the enhanced Py optical properties [1]. In this paper, the effects of a series of tetraalkylammonium salts (with a variety of chain lengths and anions) on Py optical properties are investigated in order to identify the controlling parameters of the Py fluorescence quenching in the binary system from the solution to solid state [2]. Several experimental approaches including steady-state fluorescence spectroscopy, ¹³C-NMR, and time-dependent fluorescence decay are employed in order to seek for the fundamental understanding of the optical properties of Py. The result shows that cation chain length of tetrabutylammonium (TBA⁺) and hexafluorophosphate (PF₆⁻) anion play an important role in the Py optical properties. These interaction between Py and salts is mainly governed by dynamic quenching processes [2]. The knowledge obtained in this study provides insights to the design of the molecular self-assembly for the development of sensors with high performance.

[1] Jang, H.-S et al. J. Phys. Chem. C 2012, 117, 1428-1435.

[2] Jang, H.-S et al. submitted.

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