Supplementary material (ESI) for Journal of Materials Chemistry

Electronic Supplementary Information for

Photoconductivity of Liquid Crystalline Derivatives of Pyrene and Carbazole

Monika J. Sienkowska,[a] Hirosato Monobe,[b] Piotr Kaszynski,[a]* and Yo Shimizu[b]

[a] Organic Materials Research Group Department of Chemistry, Vanderbilt University, Nashville, TN 37235, USA.

[b] Nanotechnology Research Institute, National Institute of Advanced Industrial Science and Technology, AIST Kansai Centre, Midorigaoka 1-8-31, Ikeda, Osaka, 536-8577, Japan.

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1. UV Spectroscopy Details

The absorption of both compounds **1a** and **2a** were measured quantitatively according to Beer's law, by plotting the molar absorbance versus concentration (Figure 1).

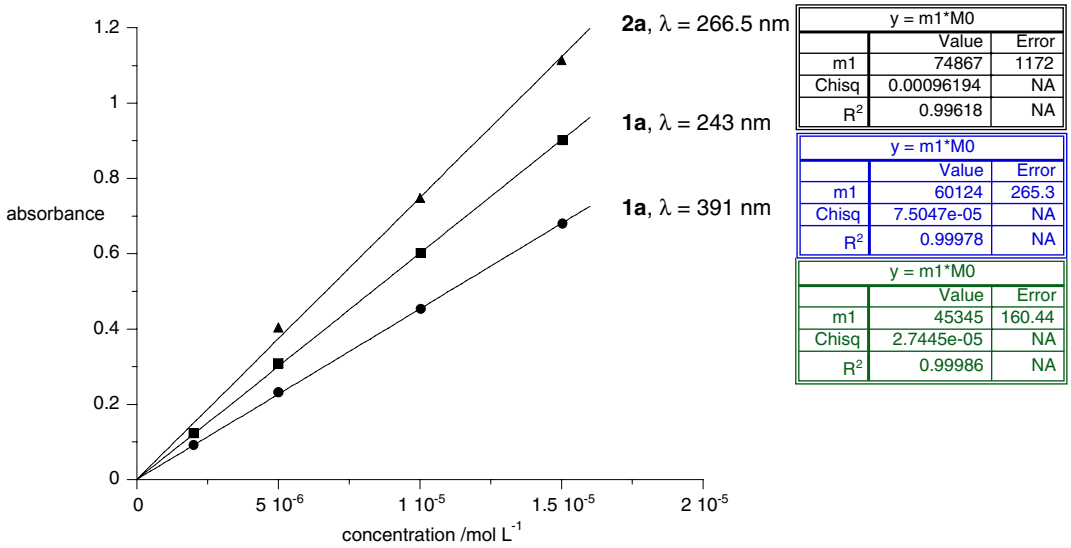

Figure 1. Linear dependence of absorbance versus molar concentration of pyrene derivative **1a** at λ = 243 nm and λ = 391 nm, and carbazole derivative **2a** at λ = 266.5 nm in cyclohexane.

1a: UV-Vis λ_{max} (log ε): 207 (5.12), 243 (4.78), 294 (4.58), 307 (4.56), 391 (4.66).
2a: UV-Vis λ_{max} (log ε): 209 (4.99), 267 (4.91), 358 (3.83), 368 (3.83).

2. XRD Data

Table 1. X-ray diffraction data for 1,3,6,8-tetrakis(3,4-dioctyloxyphenyl)pyrene (**1a**) and 1,3,6,8-tetrakis(3,4-dioctyloxyphenyl)carbazole (**2a**).

Sample	Temp /ºC	Phase	Miller indices *hkl*	d_{exp} /Å obs	d_{exp} /Å calcd	Cell parameters /Å
1a	80	Col_h	100	25.6	25.0	a = 28.9
			110	14.1	14.4	
			200	**12.5**	**12.5**	
			210	9.5	9.45	
			300	8.2	8.3	
			310	6.7	6.9	
			400	6.2	6.25	
			500	4.9	5.0	
			001	3.9		
2a	120	Col_h	100	26.4	25.8	a = 29.8
			110	15.1	14.9	
			200	**12.9**	**12.9**	
			210	9.8	9.75	
			300	8.5	8.6	
			310	7.1	7.15	
			400	6.4	6.45	
			001	3.7		

3. Photoconductivity Data

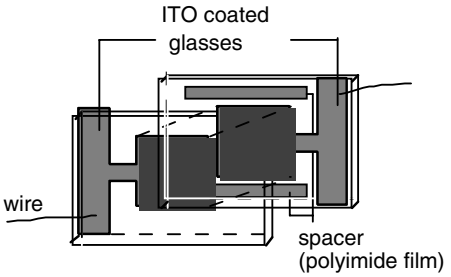

Figure 2. Sandwich-type cell for photoconductivity measurements.

Table 2. Positive (μ_+) and negative (μ_-) charge mobilities in pyrene **1a** and carbazole **2a**.

	Temperature /°C	μ_+ /$cm^2V^{-1}s^{-1}$	μ_- /$cm^2V^{-1}s^{-1}$
Pyrene **1a**	85	3.2×10^{-3}	–
	80	3.0×10^{-3}	–
	75	2.9×10^{-3}	–
	70	2.6×10^{-3}	–
	65	2.5×10^{-3}	–
	60	2.3×10^{-3}	3.2×10^{-3}
	55	2.1×10^{-3}	–
	50	2.0×10^{-3}	–
	45	1.8×10^{-3}	–
	40	1.6×10^{-3}	–
	35	1.3×10^{-3}	–
	30	1.1×10^{-3}	1.4×10^{-3}
Carbazole **2a**	120	1.2×10^{-3}	7.3×10^{-6}
	90	5.5×10^{-3}	2.6×10^{-5}
	30	dispersive	–

The estimated uncertainty of charge mobility values is about 20%, which was based on the assumed 10% of uncertainty of the cell thickness and the depth of light penetration of the sample.