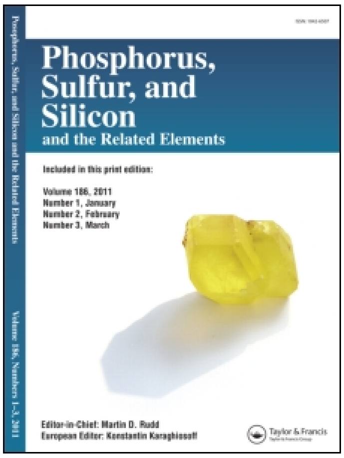

Phosphorus, Sulfur, and Silicon and the Related Elements
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713618290

Synthesis and Optical Properties of Fluorescent Materials Derived from Tricyclic Heterocycles

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To cite this Article Nishide, Yosuke , Inagaki, Yusuke , Osuga, Hideji and Tanaka, Kazuhiko(2005) 'Synthesis and Optical Properties of Fluorescent Materials Derived from Tricyclic Heterocycles', Phosphorus, Sulfur, and Silicon and the Related Elements, 180: 5, 1479 — 1480

To link to this Article: DOI: 10.1080/10426500590913212

URL: http://dx.doi.org/10.1080/10426500590913212

Phosphorus, Sulfur, and Silicon, 180:1479–1480, 2005
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ISSN: 1042-6507 print / 1563-5325 online
DOI: 10.1080/10426500590913212

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Synthesis and Optical Properties of Fluorescent Materials Derived from Tricyclic Heterocycles

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We have recently found that 1,2-diarylethylene **1a** derived from *ortho*-fused tricyclic benzo[1,2-*b*:4,3-*b*′]dithiophene is thermally stable and highly fluorescent in toluene solution. We now wish to report the synthesis and characterization of highly fluorescent materials like dimeric (**2a**, **2b**) and trimeric (**3a**, **3b**) compounds consisting of dihexylbenzodithiophenes. The introduction of hexyl groups is very important in the synthesis and purification of these compounds, because longer alkyl groups in the benzodithiophene skeleton increase the solubility in organic solvents. The oligomeric derivatives such as **4a** ($n = 2$) and **5a** ($n = 3$) were also prepared and characterized.

The fluorescence band maxima of **4a** and **5a** in toluene solution undergo red-shifting with increasing conjugation length of the benzanthracene moiety. A significant red shift ($\sim$29 nm) is observed in the thin film of **3a**, compared to the spectrum in toluene. This is probably because of the aggregation, planarization, and excimer formation in the solid state.

Received July 9, 2004; accepted October 5, 2004.

This study was supported by Industrial Technology Research Grant Program in 2004 from New Energy and Industrial Technology Development Organization (NEDO) of Japan.

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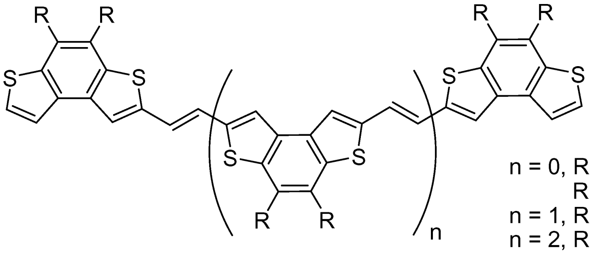
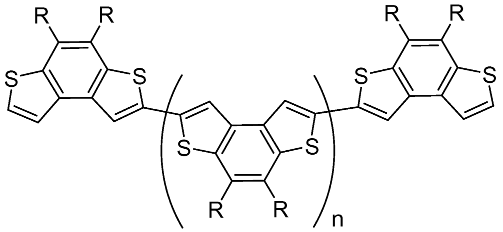


n = 0, R = H (**1a**)
R = n-C_6H_{13} (**2a**)
n = 1, R = n-C_6H_{13} (**3a**)
n = 2, R = n-C_6H_{13} (**4a**)
n = 3, R = n-C_6H_{13} (**5a**)



n = 0, R = H (**1b**)
R = n-C_6H_{13} (**2b**)
n = 1, R = n-C_6H_{13} (**3b**)
n = 2, R = n-C_6H_{13} (**4b**)
n = 3, R = n-C_6H_{13} (**5b**)

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