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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>

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To cite this Article Osuga, Hideji , Nagai, Shinsuke and Tanaka, Kazuhiko(2005) 'Synthesis and Properties of Polyalkylated Thiaheterohelicenes', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 180: 5, 1499 — 1500

To link to this Article: DOI: 10.1080/10426500590913375

URL: <http://dx.doi.org/10.1080/10426500590913375>

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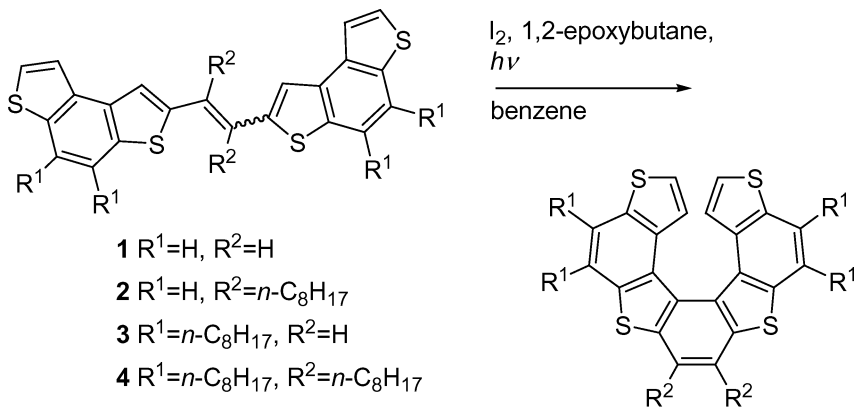
Synthesis and Properties of Polyalkylated Thiaheterohelicenes

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Helicenes have a chirality based on the screw sense of helicity: a right-handed helix (*P*) and a left-handed helix (*M*). Because chiral helicenes having more than six aromatic rings are optically stable and unique with respect to their very high rotational value (due to the inherent chiral chromophore), functionalized helicenes of high optical purity are very attractive as chiral ligands, chiral stationary phases, or nonlinear optical materials. However, there are only a few examples of synthesis of these compounds because of difficulties in preparation and purification resulting from their poor solubility in organic solvents.

We now wish to report the synthesis and properties of novel thiaheterohelicenes containing alkyl groups on the outer helix. The



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

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TABLE I Solubilities of Unsubstituted and Polyalkylated [7]Heterohelicenes

Solvents	1	2	3	4
Hexane	1.43 g/l	8.46 g/l	18.5 g/l	644 g/l
Toluene	9.10 g/l	426 g/l	305 g/l	543 g/l
THF	36.3 g/l	580 g/l	415 g/l	854 g/l
CHCl ₃	15.4 g/l	426 g/l	77.7 g/l	628 g/l
Ethanol	1.41 g/l	17.1 g/l	4.27 g/l	0.33 g/l

solubility of polyalkylated helicenes was greatly improved compared to that of unsubstituted thiaheterohelicene. Although higher helicenes consisting of more than ten aromatic rings are very interesting because of their unique structures and properties, such as molecular springs, only a few examples of the synthesis of such compounds have been reported. The synthesis of higher homologues such as [11] and [15]helicenes was also investigated.

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