

This article was downloaded by:

On: 29 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## 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>

## S-Allyl(Propargyl)-S-Aryl(Hetaryl) Sulfides and Sulfones; Synthesis and Thermal Behaviour

Gerhard Himbert<sup>a</sup>; Martin Ruppnich<sup>a</sup>; Uwe Schmidt<sup>a</sup>

<sup>a</sup> Fachbereich Chemie der Universität, Kaiserslautern, FRG

**To cite this Article** Himbert, Gerhard , Ruppnich, Martin and Schmidt, Uwe(1993) 'S-Allyl(Propargyl)-S-Aryl(Hetaryl) Sulfides and Sulfones; Synthesis and Thermal Behaviour', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 74: 1, 387 — 388

**To link to this Article:** DOI: 10.1080/10426509308038128

**URL:** <http://dx.doi.org/10.1080/10426509308038128>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## S-ALLYL(PROPARGYL)-S-ARYL(HETARYL) SULFIDES and SULFONES; SYNTHESIS and THERMAL BEHAVIOUR

GERHARD HIMBERT\*, MARTIN RUPPMICH and UWE SCHMIDT  
Fachbereich Chemie der Universität, Postfach 30 49,  
D-6750 Kaiserslautern, FRG

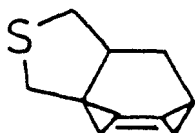
**Abstract** Allyl(9-anthrylmethyl)sulfide and allenyl [1-naphthyl(or 2-furyl- or 9-anthryl-)methyl]sulfones undergo the Intramolecular Diels-Alder reaction.

### INTRODUCTION

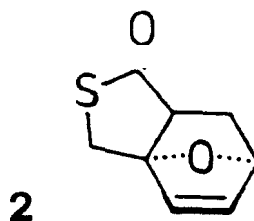
Allyl(propargyl) furfuryl(9-anthrylmethyl) sulfides undergo the Intramolecular Diels-Alder[IMDA]-reaction<sup>1</sup>. We became interested in this reactivity: we synthesized the outstanding derivatives and the corresponding sulfones and some thio-esters and studied their thermal behaviour.

### RESULTS

Propargyl furfuryl sulfide **1a** and the appropriate sulfone don't undergo the IMDA-reaction, while S-allyl-S-(9-anthrylmethyl)sulfide and S-furfuryl thioacrylic ester smoothly do this (see **1** and **2**).



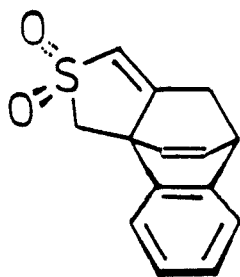
86%  
mp = 124–126°C



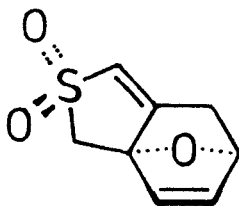
**2**  
11%  
bp = 80–81°C/0.03 Torr

(Arylmethyl)thiols [Ar = 1-Naphthyl-, 2-Furyl-, 9-Anthryl-] react with propargyl bromide to varying mixtures of arylmethyl (propargyl-, allenyl- and/or 1-propynyl) sulfides. Oxidation with metachloroperbenzoic acid furnishes likewise

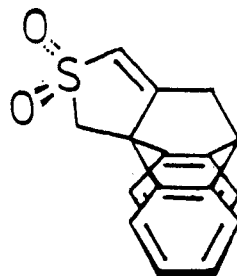
varying mixtures of the corresponding sulfones. The highest IMDA reactivity is found with the allene derivatives. By heating up mixtures of the tautomers<sup>2</sup> in the presence of triethylamine, the allenes isomerize to the following IMDA-products, (s. 3-5):



**3** 20%  
mp = 114-115°C

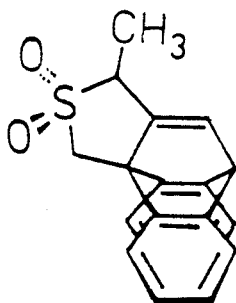


**4** 85%  
mp = 108-109°C

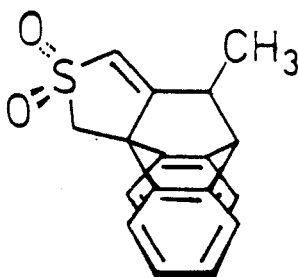


**5** 67%(25%)  
mp = 284-286°C

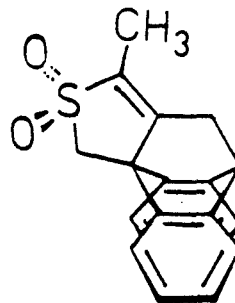
Analogously, we synthesized (9-anthrylmethyl) [3-(1-butyryl)] and [1,2-butadienyl and 1-methyl-1,2-propadienyl resp.] sulfones. All three isomers undergo the IMDA-reaction, s. 6-8.



**6** 85%  
mp = 276-277°C



**7** 5%  
mp = 268-269°C



**8** quantit.  
mp = 249-250°C

## REFERENCES

- 1 a) L. L. Klein, *J. Org. Chem.* **50**, 1770 (1985). - b) J. Moursounidis and D. Wege, *Tetrahedron Lett.* **27**, 3045 (1986).- c) C. E. Ciganek, *J. Org. Chem.* **45**, 1497 (1980).
- 2 compare: C. J. M. Stirling, *J. Chem. Soc.* **1964**, 5856.