

This article was downloaded by:

On: 28 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>

## Photochromism and Photoisomerization in Some 2,3,4,4,5,6-Hexasubstituted 4H-Thiopyrans

Hooshang Pirelahi; Hossein Rahmani; Arash Mouradzadegun; Ali Fathi; Ali Moudjoodi

**To cite this Article** Pirelahi, Hooshang , Rahmani, Hossein , Mouradzadegun, Arash , Fathi, Ali and Moudjoodi, Ali(1997) 'Photochromism and Photoisomerization in Some 2,3,4,4,5,6-Hexasubstituted 4H-Thiopyrans', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 120: 1, 403 — 404

**To link to this Article:** DOI: 10.1080/10426509708545569

**URL:** <http://dx.doi.org/10.1080/10426509708545569>

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.

## Photochromism and Photoisomerization in Some 2,3,4,4,5,6-Hexasubstituted 4H-Thiopyrans

HOOSHANG PIRELAHI, HOSSEIN RAHMANI, ARASH MOURADZADEGUN, ALI FATHI AND ALI MOUDJOODI

*Department of Chemistry, University of Tehran,  
P.O.Box 13145-143, Tehran, IRAN*

Photochromism and photoisomerization reactions of some new 2,3,4,4,5,6-hexasubstituted 4H-thiopyrans are described.

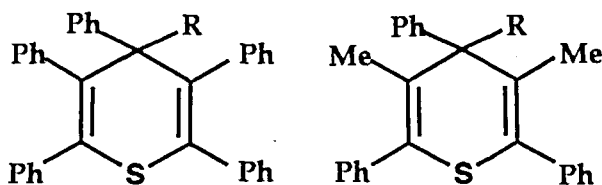
### INTRODUCTION

In the course of our studies on photochromism and photoisomerization of 2,4,4,6-tetrasubstituted 4H-thiopyrans<sup>1</sup>, it seemed of considerable import to inspect the effects of 3,5-substitutions on these phenomena. Accordingly the new hexasubstituted 4-aryl-2,3,4,5,6-pentaphenyl-4H-thiopyrans **1a-c**, 2,3,4,5,6-pentaphenyl-4-methyl-4H-thiopyran **1d**, 4-aryl-2,4,6-triphenyl-3,5-dimethyl-4H-thiopyrans **2a-c** and 2,4,6-triphenyl-3,4,5-trimethyl-4H-thiopyran **2d** analogues were selected for synthesis and the present study.

### RESULTS AND DISCUSSION

The 4H-thiopyrans **1a-c**, in contrast to the photochromic 2,4,4,6-tetraarylsubstituted 4H-thiopyrans<sup>1,2</sup>, did not exhibit any photochromic or photoisomerization behaviour in the solid state, however, in 4H-thiopyrans **2a-c** the photochromic and photoisomerization properties were restored with a hypsochromic shift in the absorption maxima of the photochromic species as well as a decrease in the yields of the photorearranged products. The 4H-thiopyrans **1d** and **2d** in accord with non-photochromic 2,4,6-triphenyl-4-alkyl-4H-thiopyran analogues<sup>1,2</sup> remained colourless in the solid state.

None of the non-photochromic 4H-thiopyrans **1a-c** or photochromic **2a-c** exhibited any reversible photochemical colour changes in benzene solution.

**1a-d****a**, R = Ph**b**, R = CF<sub>3</sub>C<sub>6</sub>H<sub>4</sub>**2a-d****c**, R = p-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>**d**, R = Me

On irradiation of **1a-c** in benzene with UV light of  $\lambda=254$  nm no absorption bands around 370 nm characteristic for the expected isomeric 2H-thiopyrans could be detected. Irradiations of **2a-c** in methanol gave mixtures of the both corresponding aryl-migrated 2H-thiopyran isomers. Irradiation of **1d** or **2d** in benzene-d<sub>6</sub> in a sealed pyrex NMR tube furnished only the phenyl-migrated isomer.

The results are consistent with the operation of unfavourable steric interactions in the transition states that lead to photoproducts caused by non-bonded repulsions between the substituents of sulfur ring which lessen the ability of the aryl groups to delocalize charges.

## ACKNOWLEDGMENT

Financial assistance from the Research Council at the University of Tehran through Grant No. 254/1/514 is gratefully acknowledged.

## REFERENCES

1. H. Pirelahi, M.S. Hashtroodi, M.S. Abaie and Y.R. Shariati, *J.Photochem. Photobiol. A:Chem.*, **81**,21 (1994); H. Pirelahi and M.S. Hashtroodi, *Phosphorus Sulfur Silicon*, **95-96**, 475 (1994).
2. P. Sebek, S. Nespurek, R. Hrabal, M. Adamec and J. Kuthan, *J. Chem. Soc., Perkin Trans. 2*, 1301 (1992); Y. Mori and K. Maeda, *J. Chem. Soc., Perkin Trans. 2*, 2061 (1991).