

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>

Spectroscopic Studies of Mixed Phosphoric-Carboxylic Imides

Sieglinde Bauermeister^a; Tomasz A. Modro^a; Linda Prinsloo^a

^a Department of Chemistry, Centre for Heteroatom Chemistry, University of Pretoria, Pretoria, South Africa

To cite this Article Bauermeister, Sieglinde , Modro, Tomasz A. and Prinsloo, Linda(1996) 'Spectroscopic Studies of Mixed Phosphoric-Carboxylic Imides', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 111: 1, 149

To link to this Article: DOI: 10.1080/10426509608054778

URL: <http://dx.doi.org/10.1080/10426509608054778>

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.

SPECTROSCOPIC STUDIES OF MIXED PHOSPHORIC-CARBOXYLIC IMIDES

SIEGLINDE BAUERMEISTER, TOMASZ A MODRO, LINDA PRINSLOO
Centre for Heteroatom Chemistry, Department of Chemistry, University of Pretoria,
0002 Pretoria, South Africa

Abstract IR spectroscopic studies of hydrogen bonding (intra- vs intermolecular) in selected mixed phosphoric-carboxylic imides (RO)₂P(O)NR'C(O)R" **1**, R = Et, R' = H, alkyl, R" = OEt, Ph, are presented.

INTRODUCTION

IR spectroscopy proved ideal to determine the position of the double bonds and possible intramolecular hydrogen bond formation¹ in the title compounds. Compounds **1** and their salts show antiviral activity² and also some interesting complexing properties.³ These systems exhibit ambident properties both in electrophilic and nucleophilic reactions.⁴

RESULTS AND DISCUSSION

While β-dicarbonyl compounds exist as an intramolecularly hydrogen bonded keto-enol system, no intramolecular hydrogen bond formation was observed for β-diphosphonates.¹ For mixed methylene derivatives, the C=O group exists in its enolic form, while the P=O group forms intermolecular hydrogen bonds with external donors. Methanol proved to be a too weak hydrogen donor towards substrates **1**, while phenol caused a strong to modest ν_{C=O} shift indicating that the C=O group is a better hydrogen bonding acceptor than the P=O group. The large P=O frequency shift difference for the *N*-unsubstituted and *N*-substituted ethoxycarbonyl phosphoramidate substrates in the absence of an external donor, indicates the existence of tautomerism towards the P=O group and not the C=O group.

REFERENCES

1. L J Shayi, MSc Thesis, University of Pretoria, (1994).
2. (a) N G Zabiroy *et al*, *Khim-Farm, Zh*, **23**, 600 (1989); (b) N G Zabiroy *et al*, *Khim-Farm, Zh*, **25**, 46 (1991).
3. (a) N G Zabiroy *et al*, *J Gen Chem USSR, Engl Transl*, **60**, 1783 (1990); (b) E G Yarkova *et al*, *J Gen Chem USSR, Engl Transl*, **60**, 1790 (1990).
4. S Bauermeister, T A Modro, and A Zwierzak, *Heteroatom Chem*, **4**, 11 (1993).