

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>

On the Preparation and Properties of a Thiodi-Phosphorus (IV)-Acid Betaine

G. -U. Wolf^a

^a Central Institut of Inorganic Chemistry of the Academy of Sciences, Berlin, GDR

To cite this Article Wolf, G. -U.(1990) 'On the Preparation and Properties of a Thiodi-Phosphorus (IV)-Acid Betaine', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 51: 1, 469

To link to this Article: DOI: 10.1080/10426509008040993

URL: <http://dx.doi.org/10.1080/10426509008040993>

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.

ON THE PREPARATION AND PROPERTIES OF A THIODI-PHOSPHORUS (IV)-ACID BETAINES

G.-U. WOLF

Central Institut of Inorganic Chemistry of the
 Academy of Sciences, Rudower Chaussee 5, Berlin 1199,
 GDR

On heating phosphorus(V) sulfide in anhydrous pyridine the pentathiodiphosphorus(V) acid- P,P' -bis(pyrididium betaine), $(C_5H_5N)_2P_2S_5$ (1), is formed (1,2). In 1 the P atoms are linked via an S atom. The nucleophilic degradation of the sulfid P_4S_7 by pyridine yields the new tetrathiodiphosphorus(IV) acid- P,P' -bis(pyrididium betaine), $(C_5H_5N)_2P_2S_4$ (2) which contains a direct P-P bond. 2 is already formed at room temperature on shaking of P_4S_7 with anhydrous pyridine for several days, resulting as a microcrystalline yellow solid in almost 50% yield. As has been proven by means of ^{31}P NMR spectroscopy, P_4S_7 is a further product of this reaction.

On reaction of the sulfide P_4S_7 with anhydrous pyridine an equimolar mixture of 1 and 2 results:



Due to different solubilities in pyridine, the dimeric betaines may be easily separated from each other.

2 is significantly more stable than 1. On heating of 2 loss of pyridine sets in only above 140°C. The oxidation of 2 with H_2O_2 yield hypophosphate, $M'_4(P_2O_2S_4)$. On heating in strongly basic solution the corresponding tetrathiohypophosphate is formed in high yield:



(1) E. Fluck, H. Binder, Z.anorg.allg.Chem. 354, 113 (1967)

(2) M. Meisel, H. Grunze, Z.anorg.allg.Chem. 360, 277 (1968)