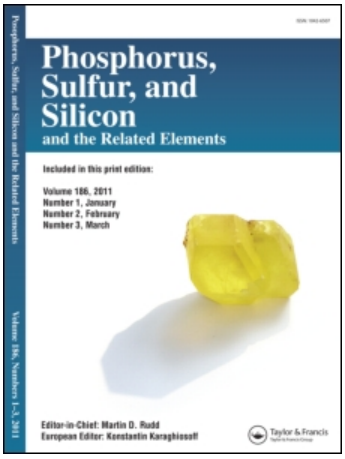

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Formation of Some New Four-Memberd Phosphorus-Nitrogen and Phosphorus-Nitrogen-Sulfur Ring Systems

C. Donath[a]; M. Meisel[a]
[a] Zentralinstitut für anorganische Chemie der Akademie der Wissenschaften der DDR, Berlin, Rudower, Chaussee

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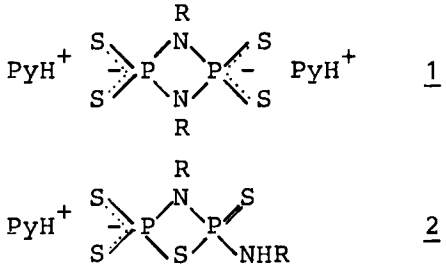
FORMATION OF SOME NEW FOUR-MEMBERED PHOSPHORUS-NITROGEN AND PHOSPHORUS-NITROGEN-SULFUR RING SYSTEMS

C.DONATH and M.MEISEL
Zentralinstitut für anorganische Chemie der Akademie der Wissenschaften der DDR, DDR-1199 Berlin, Rudower Chaussee

Continuing the study on the course of reaction of $Py \cdot PS_2Cl$ with primary amines we have found a method to prepare the hitherto unknown tetrathio-substituted phosphetidine compounds 1 and 2. Primary amines react with $Py \cdot PS_2Cl$ in a molar ratio of 1:1 in the presence of a base either to diazaphosphetidines 1 or to azathiaphosphetidines 2 according to equation (1):

$$2\ Py \cdot PS_2Cl + 2\ RNH_2 \xrightarrow[base \cdot HCl]{base}$$



1

2

With unsubstituted and ortho-substituted aromatic amines and also aminosubstituted heterocyclic compounds the formation of 1 is prefered.

An increasing sterical hindrance like in 2,6-di- and 2,4,6--trisubstituted anilines favours the arrangement to an azathia-ring system 2. In the same way as the sterical hindered aromatic amines the corresponding aliphatic ones like $t\text{-}BuNH_2$ and $i\text{-}PrNH_2$ react to 2.

With unbranched aliphatic amines both ring systems can be formed depending on the base used. In general the presence of a weak base (pyridine) results in P_2NS-ring and a strong base (NEt_3) in P_2N_2-ring formation.

In some cases both types of compounds are yielded in the reaction mixture. But normally one ring systems is prefered and the reaction conditions can be choosed in that way only one compound is formed.