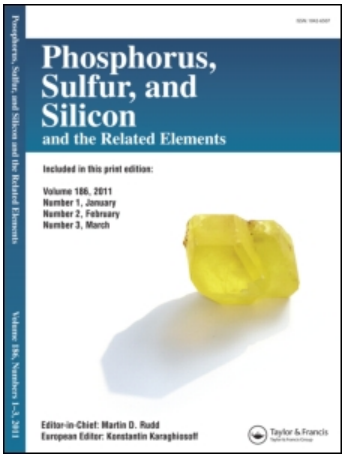


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# Studies on the Synthesis and Perporties of Ethyl-N-Alkylphosphoro(Thioureido)Thioates

Huiling Wang[a]; Yang Huazheng Wu Ye[a]
[a] Institute of Elemento-Organic Chemistry, Nankai University, Tianjin, P.R. of China

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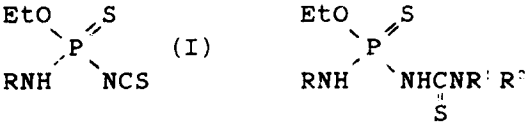
# STUDIES ON THE SYNTHESIS AND PERPORTIES OF ETHYL-N-ALKYLPHOSPHORO(THIOUREIDO)THIOATES

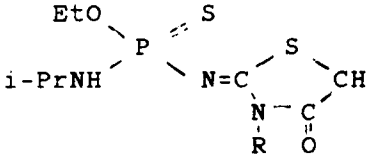
HUILING WANG, YANG HUAZHENG WU YE
Institute of Elemento-Organic Chemistry, Nankai University, Tianjin, P.R. of China



O-Ethyl-N-alkylphosphoro(thioureido)thioates(II) were synthesized by the addition of O-ethyl-N-alkylphosphorisothiocyanatidothioates(I) with corresponding alkyl or aryl amines,




in which R=$C_1$-$C_3$, $R^1$, $R^2$=H, alkyl or aryl. Their structures were confirmed by IR, $^1$H NMR, MS and elemental analysis. The results of bioassay showed that they had fairly good fungicidal and herbicidal activities. When II($R^1$=H,$R^2$=i-Pr,Ph,aryl etc.) reacted with chloroacetyl chloride, the compounds III were given.




(III)

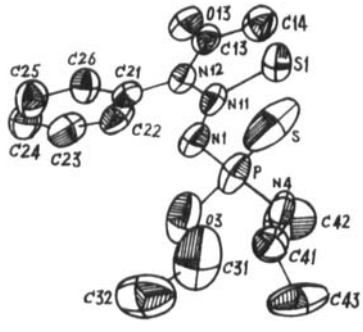



figure 1 The structure of III(R=Ph)

The structure was confirmed by elemental analysis, IR and $^{13}$C NMR. The IR absorption peak of -C=N- appeared at 1580 $cm^{-1}$ and the $^{13}$C NMR spectra indicated that the chemical shift was 164.80ppm. However, $^{13}$C shift (139.63ppm) of the starting C=S of thiourea derivative was disappeared. The X Ray diffraction analysis (R=Ph) confirmed that the carbonyl group of compound III was connected with nitrogen atom and the five number ring was nearly a plan which has an angle 64.17°+0.23 with benzene ring(figure 1). The fungicidal activity of compound III was lower than II.