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## Synthesis, Structure and Properties of N-(Thio)Phosphoryl Thiomides

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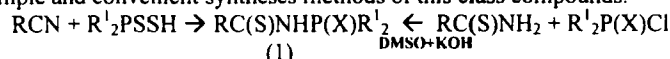
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## Synthesis, Structure and Properties of N-(Thio)Phosphoryl Thioamides

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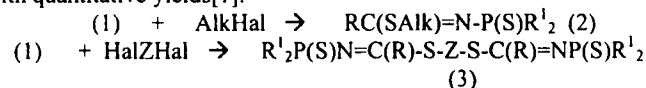
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The analysis of all known synthesis methods of N-(thio)phosphorylthioamides of the common formula  $RC(S)NHP(X)R'_2$  (1), where  $R=Alk, Ar$ ;  $R'=OAlk, OAr, SAlk, SAR$ .  $Alk, Ar$ ;  $X=O, S$  has been gave in this report. We worked out the simple and convenient syntheses methods of this class compounds.



It was studied acidic-basic properties of compounds (1) (pKa 8-10) and the structures by X-ray, IR and NMR ( $^{31}P$ ,  $^{13}C$ ,  $^1H$ ) methods and it was discovered the prototropic and phosphorylotropic transformations. The thioamides (1) are the effective complexing compounds which assist form stable chelate complexes with such metals as Pd(II), Pb(II), Ag(I), Pt(II), Cu(II), Zn(II), Hg(II), Cd(II), Co(II), Ni(II). The structure of any complexes was studied by X-ray methods.

The alkylation reactions of compounds (1) proceed only on the sulphur atoms of C=S group that allow to obtain imidothioates (2,3) with quantitative yields[1].



We used the next compounds in the capacity of alkylation agents:  $AlkHal$ ,  $ClCH_2CN$ ,  $ClCH_2COOH$ ,  $ClCH_2COOEt$ ,  $ClCH_2C(O)NH_2$ ,  $(CH_2)_3Br_2$ ,  $Cl(CH_2)_2O(CH_2)_2Cl$ ,  $Cl(CH_2CH_2O)_3CH_2CH_2Cl$ ,  $CH_2I_2$ . It was study also the reactions of oxydizing, addition on C=N bonds, addition to  $c-C_6H_{11}N=C:$ , interaction with chloride triazines, reactions with  $Me_3SiCl$  and  $SnCl_4$ [2].

### References

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- [2] N.G. Zabirov, A.A. Muratova, S.V. Kashevarov, R.A. Cherkasov, *Zhurn. Obsch. Chimii*, **66**, 419 (1996).