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Acid-Basic and Complexing Properties of Compounds with a C(X)NHP(Y) Fragments

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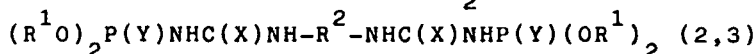
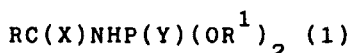
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ACID-BASIC AND COMPLEXING PROPERTIES OF COMPOUNDS WITH A C(X)NHP(Y) FRAGMENTS

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Abstract N-(thio)carbonyl(thio)amidophosphates, their open-chain and crown-containing analogues with a C(X)NHP(Y) fragments are NH acids with pKa 8-11 and the effective complexing agents for "soft" ion metals.

We have investigated acid-basic and complexing properties of N-(thio)carbonyl(thio)amidophosphates (1), their open-chain (2) and crown-containing analogues (3) with a C(X)NHP(Y) fragments:



where R=Alk, Ar; R¹=Alk; R²=(CH₂)₂O(CH₂)₂, (CH₂)₂O(CH₂)₂O(CH₂)₂, DA-15-CR-5, DA-18-CR-6, X, Y=O, S.

The compounds (1-3) are NH acids with pKa 8-11. The compounds (1-3) are effective complexing agents and they bond "soft" ions of Hg(II), Co(II), Pd(II), Ag(I), Cu(II), Pb(II) etc metals according to a chelating type. The investigation carried out have defined the constants of stability of some metal ions with ligands (I) and it has been established that the stability of the complexes falls in a series: RC(S)NHP(S)(OR¹)₂ > RC(S)NHP(O)(OR¹)₂ > RC(O)NHP(S)(OR¹)₂ > RC(O)NHP(O)(OR²)₂. The crown-containing compounds (3) are able to form complexes with "soft" ions of Hg(II), Pd(II), Cu(II) by means of the P(Y)NHC(X) exocyclic fragment as "claws" but when there are "hard" ions of Li(I), Na(I), K(I), the complexes are formed by a macrocycle as "guest-host". The compounds (3) mark the beginning of a new type of complexing agents which have been called "crown-chelating agents" or "hard-soft ligands".