



SYNTHESIS AND COMPLEX FORMING PROPERTY OF PHOSPHOR ACID DERIVATIVES

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With the aim to get new effective and selective extragents of noble and non-ferrous metals from acid solution and industrial sewage, research of the dependence of "structure effectiveness" the various phosphor acid derivatives with logical changeable structure (thiophosphor acids, derivatives of dialkoxythiophosphor, O-alkyl-methylphospon, alkylphenylphospon, diphenylphosphin acids also 4 methyl-1,3,2 dioxaphosphorinane) which contain different functional groups, the remains of heterocyclic amines and alkaloids, new derivatives of some analytical reagents were synthesized.

The structure of synthesized compounds is approved by the results of IR-, PMR-, mass-spectrum analyze.

Researching mass-spectrum decay of synthesized phosphor acid derivatives we defined that differing from O-dihexyle-S-propargyl-benzylthiophosphat, mass spectrum decay of O-dialkyl-S-(piperdynobutin-2-il)thiophosphat is characterized by the appearing $[M-H]^+$ ions and during the decay ions with high intensiveness are formed. Fragmentation of M^+ O-alkyl-O-(aminoalkyl)phenylphosphonate proceeds in various directions and characterized with the great number of phosphor containing ions, the possession of the second phenyl radical in the molecule of diphenylphospon acid derivatives changes the fragmentation of molecular ion of diphenylphospon acid derivatives.

The process of extraction of noble (Au, Ag, Pt, Pd, Os) metals from hydrochloric-sulphur-nitrogen acid medium was analyzed by radioactive indicator's method. It was noticed that structure, strength, conformation of compounds, the temperature, of acid medium (0,1-10 M) and the nature of acids (HCL, H₂SO₄, HNO₃) could have strong influence to the effectiveness of metal extraction.

During the research of metals extraction from pure solutions we can see the followings:

- 1) There are such substances, which can be used as effective group reagent towards the Au, Ag and Pd.
- 2) Derivatives with acetylene extract ions of gold from medium of HCl better and ions of silver from medium H₂SO₄.
- 3) If we complicate the structure of heterocyclic amine it can have positive influence to extraction of silver as the result of transition from morpholin to salsolidyn we can achieve the rise of effectiveness the extraction 2-5 times, but the branching of O-alkyl link between phosphoric parts and remains of heteroatom leads to the reduction of extraction effectiveness 2-5 times.

Analyses of metal's extraction from technological solutions show that effective phosphor organic extragents are:

- a) Lengthening of O-alkyl radicals in compounds molecule leads to the rise of effective extraction so Au as Ag.

- b) By the method of variation the length of O-alkyl and structure of main radical of phosphoric acid derivatives we can derive ions of gold from silver.
- c) There are such compounds, which extract ions of Pt, Os, Au, and Ag from technological solution effectively.

We worked out methods of defining the content of metals in factory sewages.

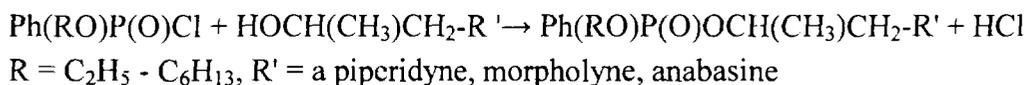
SYNTHESIS, STRUCTURE AND COMPLEX FORMING ABILITY OF PHOSPHORYLATED DERIVATIVES OF HETEROCYCLIC COMPOUNDS

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The derivatives of acids of phosphorus, due to variety of properties, are a subject of numerous researches. Now it is known, that the derivatives of acids of phosphorus apart from insect, neurotoxic, antienzymic and other kinds of physiological activity have also complex forming properties. As extra reagents of noble metals particularly are analyzed by the derivatives of dithiophosphoric acids although organophosphorus compounds with one nucleus of sulfur make extraction properties.

Therefore, with the purpose of detection of effective extra reagents of ions of argentum the phosphorylated derivatives of heterogeneous ring compounds were synthesized:



Structure of the obtained connections is confirmed by the results IR-, PMN- and mass-spectrometry.

In an IR-spectrum O-hexyls-O - [piperidinoisopropyl] phenylphosphonate has lines of absorption bands of the following functional groups (ν , cm⁻¹): (P-O-C₅H₁₁) 990-1000, (P = O) 1260, (P-C₆H₅)1450, (C-N in cycle) 1550.

In an IR-spectrum O-pentyl-[anabasinoisopropyl] phenylphosphonate has lines of absorption bands of the following functional groups (ν , cm⁻¹): (P-O-C₅H₁₁) 990-1000, (P = O) 1250, (P-C₆H₅)1450, (C-N in cycle) 1550.

In a spectrum Π MP about O-pentyl-[morpholinoisopropyl] phenylphosphonate in the field of a weak field (7, 18-7, 29 p.m.) the multiplet about tones of phenyl group is watched. Methyl protons resonate at 4,66 m.d. as multiplet. The signals O-CH₂ of protons of morpholinic cycle appear at 3,58 m.d. (4H) by the way of triplet. The protons N-CH₂ (6H) three methylene groups will derivate a composite multiple at 2, 10-2, 70 m.d.. The signal of methyl group's protons (3H) is watched at 1,15 m.d. as doublet. Final methyl group resonates at 0, 87 p.m. Six of C-CH₂ of groups give a complex signal in the field of 1, 2-1, 8 m.d.

The obtained connections are analyzed as extra reagents of ions of argentum from salt-sulphate acid medium. Process of extraction was analyzed by a method of radioactive

