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Polarographic Investigations of Functionalized Alkanephosphonic Acids. Part II

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POLAROGRAPHIC INVESTIGATIONS OF FUNCTIONALIZED ALKANEPHOSPHONIC ACIDS. PART II

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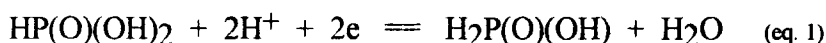
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In this presentation we attempted to verify the enigmatical problem of the polarographical activity of the phosphonic function, especially its electrochemical reduction.

Thus, the first report on the polarographic activity of the nitro substituted phenylphosphonic acid was presented by Kosolapov and Jenkins in 1957 [2].

However, the first and still single report on the polarographic reduction of the phosphonic function was published by Tomilov and co-workers in 1975 [3]. They observed that at the half-potential $E_{1/2} = -1.62$ V vs. SCE (aqueous solutions of potassium or lithium chloride as supporting electrolytes) the cathodic wave of phosphorous acid appeared. On the basis of this observation the occurrence of the polarographic reduction of the phosphonic function expressed by eq. 1 was postulated:



Occurrence of this electrochemical reaction would possess particular value (e.g. for the synthesis of polarographically active complexones or functionalized alkanephosphinous acids). Such a conversion, however, although possible in aprotic solvent does not occur in aqueous solutions on a mercury cathode.

The results indicating reluctance of the phosphonic function to the polarographical reduction in aqueous solutions were presented in this communication.

[1] For Part. I see: Z.H. Kudzin, S.W. Skrzypek, R. Skowronski, *Phosphorus, Sulfur and Silicon*, 77 (1993) 206.

[2] G.M. Kosolapov, J. Jenkins, *J. Chem. Soc.*, 1957, 3430.

[3] A.P. Tomilov, I.M. Osadchenko, L.M. Kisil, G.A. Ayuyan, *Elektrokhimiya*, 11 (1975) 1213.