SYNTHESIS, STRUCTURE AND REDOX PROPERTIES
OF TRANSITION METAL COMPLEXES WITH 2-HYDROXY
BENZYLAMINES CONTAINING HINDERED PHENOL

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In this report the results of synthesis and the studies of the structure of \( M(L_x)2 \) (\( M=\text{Ni(II), Co(II), Pd(II), VO(II), Zn(II)} \)) complexes and their free radical complexes which are formed by interaction of \( M(L_x)2 \) with \( \text{PbO}_2 \) at 300 K, in the absence of \( \text{O}_2 \) and in \( \text{CHCl}_3 / \text{toluene solutions} \) are presented. The structures of complexes are characterized by ESR, IR (for all complexes \( \nu(\text{OH}) \sim 3640 \text{cm}^{-1}, \nu(\text{NH}) \sim 3340-3380 \text{ cm}^{-1} \)), electronic spectra [485-490, 625-665, 790-890 nm for \( \text{VO}(L_x)2 \), 500-610 nm for \( \text{Co}(L_x)2 \), 515-520, 600-790 nm for \( \text{Ni}(L_x)2 \), 370-385, 454-485, 515-526 nm for \( \text{Pd}(L_x)2 \)] and magnetic moments [-1.73-1.75 \( \mu_B \) for \( \text{VO}(L_x)2 \), 4.48-4.56 \( \mu_B \) for \( \text{Co}(L_x)2 \), 3.32-3.85 \( \mu_B \) for \( \text{Ni}(L_x)2 \)] that are characteristic for tetrahedral geometry around chelate rings.

\[ x = H, \text{Br}, (L_x)2 \]

It has been established that interactions of these compounds with \( \text{PbO}_2 \) in the solutions of \( \text{CHCl}_3 \) and in the absence of \( \text{O}_2 \) leads to the formation of stable radical particles. Upon the oxidation of \( \text{Ni}(L_x)2, \text{VO}(L_x)2 \) and \( \text{Zn}(L_x)2 \) complexes, in the ESR spectra well-resolved high intensive signal consisting of 9 superhyperfine lines with intensity ratio of 1:4:7:8:8:7:4:1 (\( g \sim 2.003-2.004 \), \( A^N \sim 1.7-2.24 \text{ G, } A^H \sim 0.85-1.12 \text{ G} \)) were observed. By the oxidation of \( \text{Pd}(L_x)2 \), radical intermediates were observed in which ESR spectra with the parameters \( g=2.0044-2.0065, A^H \sim 1.229-1.425 \text{ G, } A^N \sim 2.45-2.85 \text{ G} \) and the intensity ratio of 1:3:5:5:5:3:1. At the same conditions upon oxidation of \( \text{Co}(L_1)2 \), the ESR spectrum which consists of superpositions of low intensive octet with center at \( g=2.01 \), hyperfine coupling constant \( -6.14 \text{ G} \) and badly resolved high intensive signal with \( g=2.0035, A^H \sim 1.11 \text{ G} \) has been observed. For \( \text{Co}(L_2)2 \) spectrum which consists of superpositions of radical signal (\( g=2.0054, A^H=1.18 \text{ G} \)) and anisotropic spectrum from radical coordinated complex of \( \text{Co(III)} \) with the parameters \( g_{x,y}=2.015, g_z=1.989, A_{x,y}=4.66 \text{ G, } A_z=10 \text{ G} \) were observed.

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