

**Название публикации:**

New oxidovanadium(IV) complex with a BIAN ligand: synthesis, structure, redox properties and catalytic activity

**Авторы:**

Fomenko, I.S.a, Gushchin, A.L.a,b, Shul'pina, L.S.c, Ikonnikov, N.S.c, Abramov, P.A.a, Romashev, N.F.a,b, Poryvaev, A.S.b,d, Sheveleva, A.M.b,d, Bogomyakov, A.S.d, Shmelev, N.Y.a,b, Fedin, M.V.d, Shul'pin, G.B.e,f, Sokolov, M.N.a,b

- a) Nikolaev Institute of Inorganic Chemistry, Siberian Branch of Russian Academy of Sciences, 3 Acad. Lavrentiev Ave., Novosibirsk, 630090, Russian Federation
- b) Novosibirsk State University, 2 Pirogov Str., Novosibirsk, 630090, Russian Federation
- c) Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences, ulitsa Vavilova, dom 28, Moscow, 119991, Russian Federation
- d) International Tomography Center, Siberian Branch of Russian Academy of Sciences, 3a Institut'skaya st., Novosibirsk, 630090, Russian Federation
- e) Department of Dynamics of Chemical and Biological Processes, Semenov Institute of Chemical Physics, Russian Academy of Sciences, ulitsa Kosygina, dom 4, Moscow, 119991, Russian Federation
- f) Department of Chemistry and Physics, Plekhanov Russian University of Economics, Stremyannyi pereulok, dom 36, Moscow, 117997, Russian Federation

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**Аннотация:**

Reaction of  $\text{VOCl}_3$  with bis[N-(2,6-diisopropylphenyl)imino]acenaphthene (dpp-bian) in air afforded  $[\text{VOCl}_2(\text{dpp-bian})]$  (1). The complex was characterized by IR and UV-vis spectroscopies and elemental analysis. The crystal structure of 1 was determined by X-ray diffraction (XRD) analysis. The vanadium atom is in a square-pyramidal  $\text{OCl}_2\text{N}_4$  coordination environment. The cyclic voltammogram (CV) in dichloromethane reveals an irreversible oxidation process at +1.40 V (vs.  $\text{Ag}/\text{AgCl}$ ) assigned to the  $\text{V}(\text{IV})/\text{V}(\text{V})$  couple, and two consecutive quasi-reversible one-electron reduction processes at -0.32 V and -1.05 V (vs.  $\text{Ag}/\text{AgCl}$ ), respectively, assigned to the  $\text{bian}/\text{bian}^-$  and  $\text{bian}^-/\text{bian}^{2-}$  couples, followed by irreversible reduction at -1.6 V (vs.  $\text{Ag}/\text{AgCl}$ ). The EPR spectrum of 1 in toluene shows a single 8-line signal typical for oxidovanadium(IV) complexes with  $d1$  configuration. The magnetic behavior of 1 confirms the presence of one unpaired electron ( $\mu_{\text{eff}}(330 \text{ K}) = 1.67 \mu\text{B}$ ), and the isolation of the paramagnetic centers. Application of 1 to oxidation of alkanes documented high catalytic activity under mild conditions. The kinetics and selectivity of alkane oxygenation by the  $1/\text{H}_2\text{O}_2$  and  $1/\text{PCA}/\text{H}_2\text{O}_2$  systems (PCA is pyrazine-2-carboxylic acid) were studied. The reaction is more efficient in the presence of PCA. © The Royal Society of Chemistry and the Centre National de la Recherche Scientifique.