Full Paper

Subsection: Chemistry of Complex Compounds.

Registration Code of Publication: 13-34-4-39 Publication is available for discussion in the framework of the on-line Internet conference "New methods of synthesis, structure and application of organoelemental compounds" http://butlerov.com/synthesys/ http://butlerov.com/synthesys/

Contributed: April 4, 2013.

Electrochemical properties of new binuclear nickel(II) complexes formed by bridging $\{\mu - O_2 P(H) Ar\}$ ligands

© Ekaterina A. Trofimova,¹ Vasily M. Babaev,¹ Ildar Kh. Rizvanov,¹ Oleg G. Sinvashin,¹ and Dmitry G. Yakhvarov^{1,2}

¹ Department of Coordination Chemistry and Nanomaterials. A.E. Arbuzov Institute of Organic and Physical

Chemistry of the Russian Academy of Sciences. Arbuzov St., 8. Kazan, 420088. Tatarstan Republic. Russia.

Phone: +7 (843) 273-48-93. E-mail: trofimova-kate@mail.ru

² Physical Chemistry Division. A.M. Butlerov Institute of Chemistry. KFU.

Kremlevskava St., 18. Kazan, 420008. Tatarstan Republic. Russia.

Phone: +7 (843) 233-73-46. *E-mail:* vakhvar@iopc.ru

*Supervising author; ⁺Corresponding author

Keywords: 2,2'-bipyridine, bridging $\{\mu - O_2 P(H) Ar\}^{-}$ ligands, cyclic voltammetry, binuclear nickel(II) complexes, electrochemistry, mass-spectrometry.

Abstract

Electrochemical properties of binuclear nickel complexes $[Ni_2(\mu-O_2P(H)Ar)_2(bpy)_4]Br_2$, where Ar = Ph. 2,4,6-trimethylphenyl, 2,4,6-triisopropylphenyl, bpy = 2,2'-bipyridine, and $[Ni_2(\mu-O_2P(H)Tipp)_2]$ $(bpy)_4](BF_4)_2$ have been investigated using the methods of cyclic voltammetry and macroscale electrolysis. It has been established that electrochemical reduction/oxidation of the investigated organonickel species is chemically reversible process resulting in the formation of new complexes bearing nickel(II), nickel(I) and nickel(0) coordination centers.