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Electrochemical properties and reactivity of organonickel sigma-complex [NiBr(Mes)(bpy)] (Mes = 2,4,6-trimethylphenyl, bpy = 2,2′-bipyridine)

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Abstract

© 2015, Pleiades Publishing, Ltd. Electrochemical properties and reactivity of electrochemically activated forms of organonickel sigma-complex [NiBr(Mes)(bpy)] (where Mes = 2,4,6-trimethylphenyl, bpy = 2,2′-bipyridine) were studied. The activation of the organonickel sigma-complex was found to proceed under both electrochemical reduction and oxidation conditions to give coordinatively unsaturated forms of the complex: radical [Ni(Mes)(bpy)]• and cationic complex [Ni(Mes)(bpy)]+, respectively. It was shown experimentally that the active forms of organonickel complex [NiBr(Mes)(bpy)] can react with organic substrates (cyclohexene, octene-1, tetrahydrofuran) and convert nitriles (acetonitrile, acetonitrile-d3, chloroacetonitrile) into corresponding imines containing 2,4,6-trimethylphenyl fragment.

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Keywords

2,2′-bipyridine, cyclic voltammetry, mass spectrometry, organonickel sigma-complexes, oxidation, reduction