Ruthenium(III) complexes of β-ketoamines. Examples of unusually low Ru(IV)/Ru(III) reduction potentials

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In recent years there has been considerable interest in the high valent ruthenium complexes due to their importance in catalytic oxidative processes. The present report describes the synthesis and characterization of the title compounds whose oxidation potentials are unusually low. The complexes have been characterized with the help of spectroscopic and other techniques. These display reversible Ru(III)/Ru(II), Ru(IV)/Ru(III) couples and nearly irreversible oxidative waves assignable to Ru(IV) → Ru(V). The respective electrode potentials are as follows: Ru(III)/Ru(II), -1.20; Ru(IV)/Ru(III), 0.30 and Ru(IV) → Ru(V), 1.60 V versus SCE. The trivalent complexes can be electrooxidized in solution to EPR-silent congeners of ruthenium(IV).

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