

Synthesis, characterization, and electrochemical behavior of a cobalt(II) salen-like complex

Abstract

A new tetradentate cobalt(II)-Schiff base complex has been synthesized via the reaction of the ligand 2,2'-((1E,1'E)-(ethane-1,2-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(4-((methyl(phenyl)amino)methyl)phenol) with a stoichiometric amount of cobalt(II) acetate tetrahydrate in absolute ethanol. This cobalt(II) complex has been characterized with the aid of several spectroscopic techniques (FT-IR, UV-Vis, and mass spectrometry) as well as by thermal (TGA and DTA) and elemental analysis. Cyclic voltammetry has been employed to examine the redox behavior of the cobalt(II) complex in dimethylformamide (DMF) containing 0.10 M tetra-n-butylammonium tetrafluoroborate (TBABF₄). In addition, the electrogenerated cobalt(I) form of the complex has been (a) employed as a catalyst for the reduction of 1-iododecane and (b) compared with the behavior of cobalt(I) salen. Finally, the cobalt(II) complex has been subjected to anodic electropolymerization onto the surface of a glassy carbon electrode in DMF containing 0.10 M tetra-n-butylammonium perchlorate (TBAP). © 2015 Elsevier Ltd. All rights reserved.