Spectroscopic and structural studies of a Cr(III)-hydrazone complex and the effect of solvent on its selectivity in the oxidation of benzyl alcohol

Autorzy

Rahman Bikas

Neda Heydari

Somayeh Jashnsaz

Tadeusz Lis

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A novel chromium(III) coordination compound, $[Cr(HL)_2]Cl{\cdot}3.3(CH_3OH)$ (**1**) was obtained by the reaction of H_2L = (*E*)-4-amino-*N*′-(5-bromo-2-hydroxybenzylidene)benzohydrazide with $CrCl_3{\cdot}6H_2O$ in methanol. The structure of the obtained compound was characterized by UV–Vis, FT-IR and TGA analyses and determined by single crystal X-ray analysis. Results showed that $[Cr(HL)_2]Cl{\cdot}3.3(CH_3OH)$ is crystallized in the orthorhombic system (*Ibca* space group) and two molecules of H_2L are coordinated to the chromium ion as ONO-donor ligand and formed distorted octahedral geometry. The catalytic oxidation of benzyl alcohol was performed in the presence of H_2O_2 for investigating the catalytic activity of $[Cr(HL)_2]Cl{\cdot}3.3(CH_3OH)$. To obtain optimal condition, the effect of some parameters (concentration of oxidant, amount of catalyst, solvent and temperature) was investigated. The results confirm that chromium(III) coordination compound has high activity and selectivity in converting benzyl alcohol into benzaldehyde.

Słowa kluczowe

ONO-donor ligand, Chromium(III) coordination compound, Oxidation reaction, Catalytic activity, Benzyl alcohol

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