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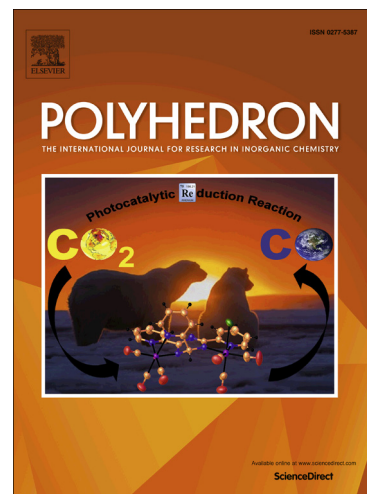
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# Homoleptic and heteroleptic complexes of chromium(III) containing 4'-diphenylamino-2,2':6',2''-terpyridine ligands

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## Abstract

Two heteroleptic bis(2,2':6',2''-terpyridine)chromium(III) complexes [Cr(**1**)(4'-(4-tolyl)tpy)][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub> and [Cr(**2**)(4'-(4-tolyl)tpy)][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub> (**1** = 4'-([2,2':6',2''-terpyridin]-4'-yl)-N,N-diphenylaniline, **2** = 4'-([2,2':6',2''-terpyridin]-4'-yl)-N,N-bis(4-methoxyphenyl)aniline, 4'-(4-tolyl)tpy = 4'-(4-tolyl)-2,2':6',2''-terpyridine) have been prepared and their spectroscopic and electrochemical properties compared with those of [Cr(4'-(4-tolyl)tpy)<sub>2</sub>][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub> and [Cr(**1**)<sub>2</sub>][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub>. The single crystal structure of [Cr(4'-(4-tolyl)tpy)<sub>2</sub>][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub>·2MeCN is presented, and the effects of accommodating three triflate anions and two MeCN molecules per cation are discussed in terms of related structures. The coordination of **1** or **2** to chromium(III) red-shifts the intra-ligand charge transfer (ILCT) band and this band exhibits a negative solvatochromic effect in some solvents. However, in H<sub>2</sub>O, MeOH, DMSO and DMF, the tpy ligands are labile; changes in the absorption spectra of solutions of [Cr(**2**)(4'-(4-tolyl)tpy)][CF<sub>3</sub>SO<sub>3</sub>]<sub>3</sub> are consistent with the formation of [Cr(4'-Xtpy)(Solv)<sub>3</sub>]<sup>3+</sup> (Solv = solvent) rather than complete ligand displacement or a ligand redistribution.

**Keywords:** Chromium(III); 2,2':6',2''-terpyridine; solvatochromic; absorption spectra; heteroleptic complex

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