

Luminescent Cr(0) and Ni(0) complexes with chelating diisocyanides – alternatives to well-known Fe(II) and Cu(I) diimines

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We recently discovered that chelating diisocyanide ligands permit the synthesis of luminescent Cr(0) and Mo(0) complexes that are isoelectronic analogues of Fe(2,2'-biipyridine)₃²⁺ and Ru(2,2'-bipyridine)₃²⁺.^[1-3] The ³MLCT lifetime of a homoleptic tris(diisocyanide)chromium(0) complex is 2.2 ns in de-aerated THF at room temperature, nearly two orders of magnitude longer than the current record lifetime for Fe(II) complexes.

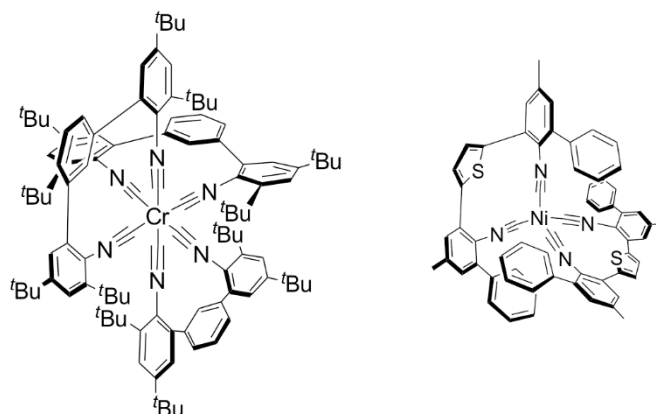


Figure 1. Homoleptic Cr(0) and Ni(0) complexes as emissive analogues of Fe(2,2'-bipyridine)₃²⁺ und Cu(dpp)₂⁺.

Using a different set of diisocyanide ligands, we could obtain Ni(0) bis(diisocyanide) complexes that can be considered analogues of Cu(dpp)₂⁺ (dpp = 2,9-diphenyl-1,10-phenanthroline).^[4] These Ni(0) complexes exhibit photoluminescence in frozen glasses.

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References:

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