

Synthesis and characterization of some novel iron complexes with an asymmetric *N*-alkyl,*N'*-aryl- β -diketiminate ligand

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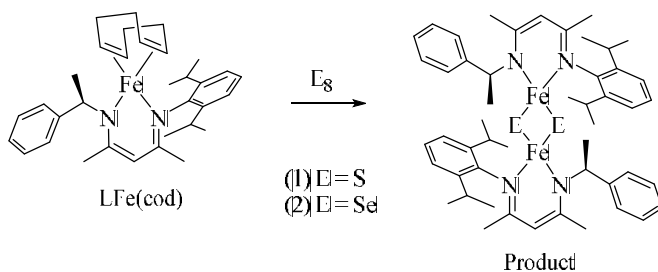
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An asymmetric *N*-alkyl,*N'*-aryl- β -diketiminate ligand L (L = 2-((S)-(-)-1-phenylethylimino)-4-(2,6-diisopropylphenylimido)pentane) was prepared. Synthesis of chloro-bridged dimer [LFe(μ -Cl)]₂ is presented here. Upon reduction in the presence of *cis*-cyclooctadiene, rare example of low-valent complex LFe(cod) was obtained. All metal complexes were fully characterized by ¹H NMR spectroscopy, X-ray crystallography and elemental analysis.

Crystallographic and IR-spectroscopic results clearly reflect that the sterically less hindered and strong electron donating properties of the asymmetric ligand L than the 2,4-bis(2,6-diisopropylphenylimido)pentane symmetric ligand, which is commonly used in the metal complexes that are used in small molecular activation and catalysis. Reactivity and kinetic studies of LFe(cod) towards small molecules, S₈ and Se₈, were investigated and the products 1 and 2 were obtained.



Electrochemical analysis of the [LFe(μ -S)]₂ suggests there are two reversible redox events while [LFe(μ -Se)]₂ shows only one reversible redox event. Chemical titrations monitored by using UV-Visible spectroscopy for [LFe(μ -S)]₂ and [LFe(μ -Se)]₂ complexes agreed with the results of electrochemical analysis.

Keywords: Iron complex; Low-valent; Asymmetric β -diketiminate; Reactivity