

Synthesis and spectroscopic ( $^1\text{H}$  NMR, ESR) characterization of new aryloxy-Mn(II) complexes: steric control over O-vs. phenyl- $\pi$ -coordination of  $\text{ArO}^-$  ligands ( $\text{ArO}^- = \text{C}_6\text{H}_5\text{O}^-$ , 4-methyl- $\text{C}_6\text{H}_4\text{O}^-$ , 3,5-dimethyl- $\text{C}_6\text{H}_3\text{O}^-$ , 2,6-di-*tert*-butyl- $\text{C}_6\text{H}_3\text{O}^-$ , 2,6-dimethyl- $\text{C}_6\text{H}_3\text{O}^-$ ) to the "Mn(II)Cp" moiety, and their reactivity with carbon dioxide.

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The coordination chemistry of phenoxide ligands, such as  $\text{C}_6\text{H}_5\text{O}^-$ , 4-( $\text{CH}_3$ )- $\text{C}_6\text{H}_4\text{O}^-$ , 3,5-( $\text{CH}_3$ ) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ , 2,6-(*tert*-butyl) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ , 2,6-( $\text{CH}_3$ ) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ , to Mn(II) has been investigated because of the possible implication of Mn(II)-phenoxide complexes as intermediates in the phenylphosphate carboxylase enzyme, a protein which catalyses the selective carboxylation of phenylphosphate to 4-OH-benzoic acid using  $\text{CO}_2$ . We report here the synthesis and characterization of  $[\text{CpMn}(\mu\text{-OAr})(\text{THF})]_2$  ( $\text{ArO} = \text{C}_6\text{H}_5\text{O}^-$ , 4-( $\text{CH}_3$ )- $\text{C}_6\text{H}_4\text{O}^-$ , 3,5-( $\text{CH}_3$ ) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ , 2,6-( $\text{CH}_3$ ) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ ) and  $[\text{CpMn}(\eta^5\text{-ArO})]$  ( $\text{ArO} = 2,6$ -(*tert*-butyl) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$  and 2,6-( $\text{CH}_3$ ) $_2$ - $\text{C}_6\text{H}_3\text{O}^-$ ) complexes, the first examples of mixed-sandwich complexes with Cp and phenate as  $\pi$ -ligands. The latter bear the 2,6-substituted phenoxide  $\pi$ -coordinated to the  $[\text{Mn}(\text{Cp})]^+$  moiety. The different mode of bonding of the phenoxide ligands to Mn(II), substantiated by  $^1\text{H}$  NMR and electron spin resonance (ESR) spectroscopy, is controlled by the steric hindrance of substituents at the 2- and 6-position. The reactivity of the  $\pi$ -bonded ligand towards  $\text{CO}_2$  is also reported as a quite rare example of nucleophilic attack at the cumulene by the ring-carbon of the phenoxide, which is driven by electron density localization at the 4-position generated upon  $\pi$ -coordination to Mn(II). *Key words:* Mn(II)-complexes, phenoxide ligands,  $^1\text{H}$  NMR spectroscopy, ESR spectroscopy, reaction with carbon dioxide.

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