

Homogeneous and Heterogeneous Catalysis Promoted by Dinuclear Bioinspired Metallohydrolases

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The design and development of suitable biomimetic catalytic systems capable of mimicking the catalytic properties of metallohydrolases represents a new challenge for bioinorganic chemists. In this work we will report on the synthesis, characterization and detailed solution and kinetic studies of a series of dinuclear mixed-valence $LFe^{III}M^{II}$ complexes ($M^{II} = Zn, Cu$ and $LH_2 = 2\text{-bis}[\{(2\text{-pyridyl-methyl})\text{-aminomethyl}\}\text{-6-}\{(2\text{-hydroxy-benzyl})\text{-}(2\text{-pyridyl-methyl})\}\text{-aminomethyl}\}\text{-4-methylphenol}$) which are able to cleave diester bonds. Furthermore, we will report a synthetic route for the attainment of an appropriate modification of the ligand L (L^1 now containing a carbonyl group attached to the terminal phenol) to develop new synthetic protocols to immobilize the catalytic center on a solid support, as for example, 3-aminopropyl-modified silica.¹ The X-ray structure of the $[L^1Fe^{III}Zn^{II}]$ and $[L^1Fe^{III}Cu^{II}]$ complexes, the synthesis and characterization of the silica-bound- $Fe^{III}Zn^{II}$ and $-Fe^{III}Cu^{II}$ complexes and their homogeneous and heterogeneous hydrolase activities with the DNA-model diester substrate 2,4-BDNPP and DNA itself are also presented.

1. Piovezan, C.; Jovito, R.; Bortoluzzi, A. J.; Terenzi, H.; Fischer, F. L.; Severino, P. C.; Pich, K. T.; Azzolini, G. G.; Peralta, R. A.; Rossi, L. M.; Neves, A. *Inorg. Chem.* **2010**, *49*, 2580.

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