

Full Paper

IP-铜(II)-L-氨基酸配合物的合成、表征及其SOD活性研究

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摘要 合成了四个新的配合物[Cu(IP)(L-Val)(H₂O)]ClO₄·1.5H₂O(1), [Cu(IP)(L-Leu)(H₂O)]ClO₄(2), [Cu(IP)(L-Tyr)(H₂O)]ClO₄·H₂O(3) and [Cu(IP)(L-Trp)(H₂O)]ClO₄·1.5H₂O(4) (IP=咪唑并[5,6-f]邻菲咯啉, L-Val= L-缬氨酸, L-Leu= L-亮氨酸, L-Tyr= L-酪氨酸, L-Trp= L-色氨酸), 并通过元素分析、摩尔电导率、红外光谱、紫外-可见光谱和循环伏安法对这些配合物进行了表征。采用X-射线单晶衍射方法对配合物3进行结构分析, 该配合物属正交晶系, 空间群P2₁2₁2, a=3.0567(4) nm, b=0.74079(9) nm, c=1.06198(13) nm, V=2.4047(5) nm³, Z=4, μ=0.1084 cm⁻¹。此外, 用改进的NBT光还原法测定了上述配合物的SOD活性, 结果表明配合物1, 2, 3 and 4均具有良好的SOD活性, IC₅₀值分别为0.072, 0.147, 0.429和0.264 μmol·L⁻¹。

关键词 [三元铜\(II\)配合物](#), [超氧化物歧化酶 \(SOD\)](#), [SOD活性](#)

分类号

Synthesis, Characterization and SOD Activities of IP-copper(II)-L-amino Acid Complexes

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Abstract Four new ternary complexes: [Cu(IP)(L-Val)(H₂O)]ClO₄·1.5H₂O (**1**), [Cu(IP)(L-Leu)(H₂O)]ClO₄ (**2**), [Cu(IP)(L-Tyr)(H₂O)]ClO₄·H₂O (**3**) and [Cu(IP)(L-Trp)(H₂O)]ClO₄·1.5H₂O (**4**) have been synthesized and characterized by elemental analysis, molar conductivity, infrared absorption spectroscopy, electronic absorption spectroscopy and cyclic voltammetry, where IP=imidazo[4,5-f][1,10] phenanthroline, L-Val=L-valinate, L-Leu=L-leucinate, L-Tyr=L-tyrosinate and L-Trp=L-tryptophanate. Complex **3** was structurally characterized by X-ray diffraction method, which crystallizes in orthorhombic space group P2₁2₁2 in a unit cell of dimensions a=3.0567(4) nm, b=0.74079(9) nm, c=1.06198(13) nm, V=2.4047(5) nm³, Z=4, μ=0.1084 cm⁻¹. The SOD-like activities of catalytic dismutation of superoxide anions () by the complexes were determined by means of modified nitroblue tetrazolium (NBT) photoreduction. The IC₅₀ values of complexes **1**, **2**, **3** and **4** are 0.072, 0.147, 0.429 and 0.264 μmol·L⁻¹, respectively

Key words [ternary copper\(II\) complex](#) [superoxide dismutase \(SOD\)](#) [SOD-like activity](#)

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