

Spectroscopic characterization of an oxovanadium(IV) complex of oxodiacetic acid and o-phenanthroline. Bioactivity on osteoblast-like cells in culture

I.E. León, S.B. Etcherverry, B.S. Parajón-Costa y E.J. Baran

Centro de Química Inorgánica (CEQUINOR, CONICET/UNLP), Facultad de Ciencias Exactas, Universidad Nacional de La Plata, C. Correo 962, 1900-La Plata, Argentina. e-mail: baran@quimica.unlp.edu.ar

Biological Trace Elements Research 147, 403-407 (2012).

The oxovanadium(IV) complex of oxodiacetic acid (H_2oda) and o-phenanthroline (ophen) of stoichiometry $[VO(ODA)(ophen)] \cdot 1.5H_2O$, which presents the interesting tridentate OOO coordination, was thoroughly characterized by infrared, Raman and electronic spectroscopies. The biological activity of the complex on the cell proliferation was tested on osteoblast-like cells (MC3T3E1 osteoblastic mouse calvaria-derived cells and UMR106 rat osteosarcoma-derived cells) in culture. The complex caused inhibition of cellular proliferation in both osteoblast cell lines in culture, but the cytotoxicity was stronger in the normal (MC3T3E1) than in the tumoral (UMR106) osteoblasts.

Vibrational and electronic spectra of $[Cu(L-ornithinato)_2Cl_2] \cdot 2H_2O$

B.S. Parajón-Costa y E.J. Baran

Centro de Química Inorgánica (CEQUINOR, CONICET/UNLP), Facultad de Ciencias Exactas, Universidad Nacional de La Plata, C. Correo 962, 1900-La Plata, Argentina. e-mail: baran@quimica.unlp.edu.ar

Spectrochimica Acta 98A, 252-255 (2012).

The FTIR and FT-Raman spectra of a Cu(II) complex of ornithine of composition $[Cu(L-Ornithinato)_2Cl_2] \cdot 2H_2O$ were recorded and analyzed in relation to its structural peculiarities and by comparison with the spectra of

ornithine hydrochloride and of other *bis*(amino acid) complexes of Cu(II). The electronic spectrum of the complex is also briefly discussed.

Quelatoterapias: Avances Recientes y Perspectivas

E.J. Baran

Centro de Química Inorgánica (CEQUINOR, CONICET/UNLP), Facultad de Ciencias Exactas, Universidad Nacional de La Plata, C. Correo 962, 1900-La Plata, Argentina. e-mail: baran@quimica.unlp.edu.ar

Aplicaciones de los Compuestos Metálicos en Medicina (D. Gambino, V. Moreno & M. Navarro, Eds.), EAE-LAP Lambert Academic Publishing GmbH & Co KG, Saarbrücken, 2012, pp. 383-445.

Las quelatoterapias ocupan un lugar central en la Medicina y Farmacología modernas, ya que estudios continuados con animales de laboratorio y una ya extensa experiencia clínica demuestran que intoxicaciones agudas o crónicas con una variedad de metales pueden ser revertidas satisfactoriamente por administración de un agente quelante adecuado. En este capítulo se discuten las características químicas, propiedades, y usos de los agentes quelantes más usuales así como de algunos nuevos y muy promisorios agentes de este tipo. En la segunda parte del capítulo se analiza y discute detalladamente el impacto biológico y bioquímico de esos agentes, así como su utilización en el tratamiento de algunas enfermedades y desórdenes, seleccionados como ejemplos.

Phytochelatin: Natural Chelating Agents Involved in Plant Protection

E.J. Baran

Centro de Química Inorgánica (CEQUINOR, CONICET/UNLP), Facultad de Ciencias Exactas, Universidad Nacional de La Plata, C. Correo 962, 1900-La Plata, Argentina. e-mail: baran@quimica.unlp.edu.ar

Advances in Plant Physiology (H.Hemantaranjan, Ed.), Scientific Publishers, Jodhpur, Vol.13, 389-414 (2012).

Phytochelatin (PCs) are small cysteine-rich peptides which normally contain only three amino acids: glutamic acid, cysteine, and glycine. PCs form a family of compounds with increasing repetitions of the Glu-Cys dipeptide linked through a γ -carboxylamide bond and include a terminal Gly. The general formula is $(\gamma\text{-Glu-Cys})_n\text{-Gly}$ where n has been reported as being as high as 11, but generally to be in the range of 2 to 5. These peptides resemble the ubiquitous tripeptide glutathione, $\gamma\text{-Glu-Cys-Gly}$, indicating the involvement of glutathione in phytochelatin biosynthesis. In this review the interrelation of phytochelatin, glutathione and metallothioneins in plant protection is discussed and the metal complexes of these three systems are analyzed in detail. Also the involvement of PCs in metal hyperaccumulation and phytoremediation of heavy metals is briefly commented.