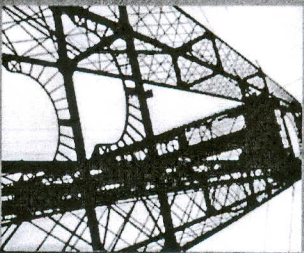
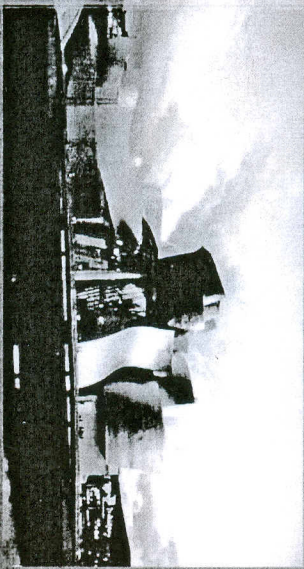


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ABSTRACTS




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A TRIPODAL HYDROXYPYRIMIDINONE - BASED COMPOUND FOR IRON AND ALUMINIUM DECORPORATION

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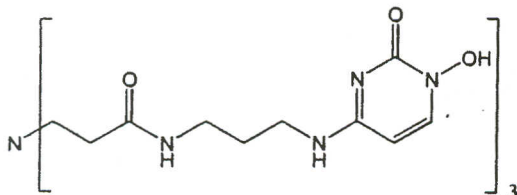
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Iron overload diseases, such as hematochromatosis or β -thalassemia associated transfusional hemosiderosis, can be lethal, unless treated with iron-chelating therapy. Moreover, both environmental exposure and therapeutic contamination can result from other *hard*-metal-ions (eg aluminium) accumulation in organs, promoting severe diseases in brain (dialysis encephalopathy) or bone (osteomalacia). Therefore, to prevent or relieve these problems, the design of new potent chelators has been a major research goal.

A series of polydentate iron-chelators based on 3-hydroxy-4-pyridinone (3,4-HP) chelating units have been developed [Santos, 2008] and, specifically, hexadentate chelators with three units attached to an amino-tris-carboxylic [Chaves et al., 2010] or kemp acid [Grazina et al., 2009] anchoring scaffold, in order to fulfill the metal coordination by formation of 1:1 ($M^{3+}:L$) complexes with improved thermodynamic and kinetic stability.

As part of an ongoing project we have recently explored hydroxypyrimidinones, another type of chelating heterocycles, which also show high-chelating ability for *hard* metal ions, particularly Fe(III) and Al(III) [Esteves et al., 2005]. These compounds are promising for clinical use since, when compared with the parent hydroxypyridinones, they are expected to have some enhanced properties, such as higher water solubility in, higher acidity and lower toxicity due to the presence of an extra nitrogen atom in the ring.

Therefore, we have decided to design and synthesize a new tripodal compound resulting from the attachment of three hydroxypyrimidinone units to nitrilopropionic acid.



Herein, we present a set of results associated to its physicochemical properties, namely its iron and aluminium chelating capacity and speciation in aqueous solution. The new chelator evidenced strong affinity for those metal ions and favourable lipo/hydrophilic balance, thus bringing good perspectives for its potential application as a metal mobilizing agent.

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References

- Santos MA, Coord. Chem Rev, 2008, 252, 1213.
 Chaves S, Marques S, Matos AMF, Nunes A, Gano L, Tuccinardo T, Martinelli A, Santos MA, to be published elsewhere, 2010.
 Grazina R, Gano L, Sebestik J, Santos MA, J. Inorg. Biochem. 2009, 103, 262.
 Esteves, MA, Cachudo A, Chaves S, Santos MA, J. Inorg. Biochem, 2005, 99, 1762.