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Synthesis and complexation properties of a new 2-aminoalkylamino-4,5-dihydroxy pyrimidine chelator

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The hydroxy pyrimidinones are N-hydroxyamide-containing heterocycles with high affinity for hard metal ions and some recent research has been focused on their potential application as toxic metal decontaminants for environmental and biological/pharmacological purposes. In the last few years we have developed several 4-aminoalkylamino-1-hydroxy-2(1H)-pyrimidinone ligands, which proved to be good chelators for hard metal ions (Fe\(^{3+}\), Al\(^{3+}\), Th\(^{4+}\)), either as monomeric species or as polymeric species, as result of monomer attachments to solid supports via the bearing alkylamine group.\(^3\)

As part of an ongoing project on supported chelating agents, we aim to extend our previous research to the design of new hydroxy pyrimidinone analogues with improved water-stability and potential as metal decontamination agents of aqueous fluids, either as free ligands or supported in insoluble solid matrices. So, herein we describe the synthesis and characterization of a new chelator, 2-(3-aminopropylamino)-4,5-dihydroxy pyrimidine (I), namely its acid-base properties and its complexation behavior towards Fe(III) and Al(III) involving potentiometric and spectroscopic techniques.

![Chemical structures](image)

Discussion of the obtained results is mostly based on comparison with those of previously developed 1-hydroxy-2(1H) pyrimidinone chelators (II).

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References