



## Novel polydentate phosphonic acids: Protonation and stability constants of complexes with Fe(III) and Cu(II) in aqueous medium

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Titre	Novel polydentate phosphonic acids: Protonation and stability constants of complexes with Fe(III) and Cu(II) in aqueous medium
Type de publication	Article de revue
Auteur	Aliouane, Nabila [1], Chafaa, Salah [2], Douadi, Tahar [3], Helesbeux, Jean-Jacques [4], Khan, Mustayeen Ahmed [5], Duval, Olivier [6], Bouet, Gilles [7]
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Résumé en anglais	<p>The acido-basic and the complexation properties of di-, tri-, and tetra-phosphonic acids (<math>H_6L1</math>, <math>H_8L2</math>, and <math>H_{10}L3</math>) toward Fe(III) and Cu(II) were determined by potentiometric titration in aqueous media at <math>25.0 \pm 0.1^\circ\text{C}</math> with constant ionic strength (0.1 M, <math>\text{NaClO}_4</math>). We have determined six, ten, and eight <math>pK_a</math> values for the di-, tri-, and tetra-phosphonic acids, respectively. In acidic conditions, e.g., <math>0 \leq \text{pH} \leq 5</math>; iron and copper presented a high affinity toward these ligands to give complex species. With the ligand <math>H_{10}L3</math>, <math>[\text{FeL}_3\text{H}_7]</math>, and <math>[\text{CuL}_3\text{H}_6]^{2-}</math> were easily obtained at pH 1.8 and 2.7, respectively. We have determined ten stability constants for the <math>H_{10}L3/\text{Fe}</math> system and nine for the <math>H_{10}L3/\text{Cu}</math> one; six and four in the cases of <math>H_8L2/\text{Fe}</math> and <math>H_8L2/\text{Cu}</math> systems, respectively. Finally, five stability constants were calculated for the <math>H_6L1/\text{Fe}</math> system and four for the <math>H_6L1/\text{Cu}</math> one. We have not observed any insoluble species in these complexes in acidic medium as well as in alkaline solutions.</p>
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