

Supplementary Material

A novel thermodynamic approach for the complexation study of toxic metal cations by landfill leachate

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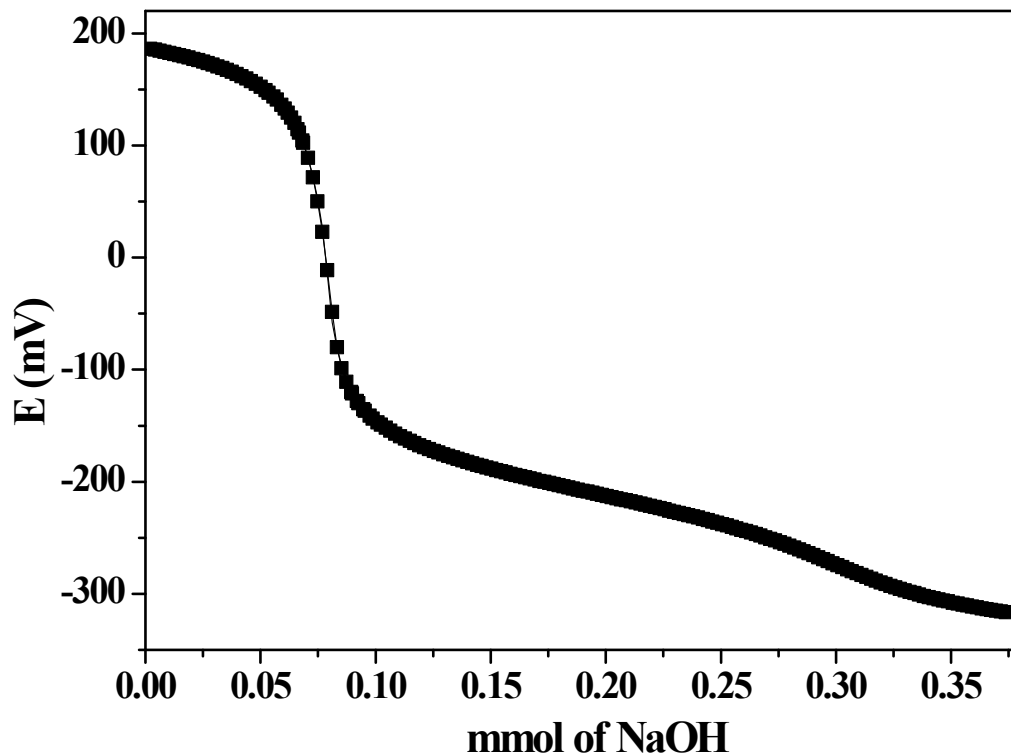


Figure 1S. Potentiometric titration curve at $T = 298.15$ K of 25 mL of solution containing 1.25 cm^3 of leachate, $\text{NaCl } 0.1 \text{ mol dm}^{-3}$ and $\text{HCl } 0.015 \text{ mol dm}^{-3}$ and curve of fit obtained with BSTAC computer program.

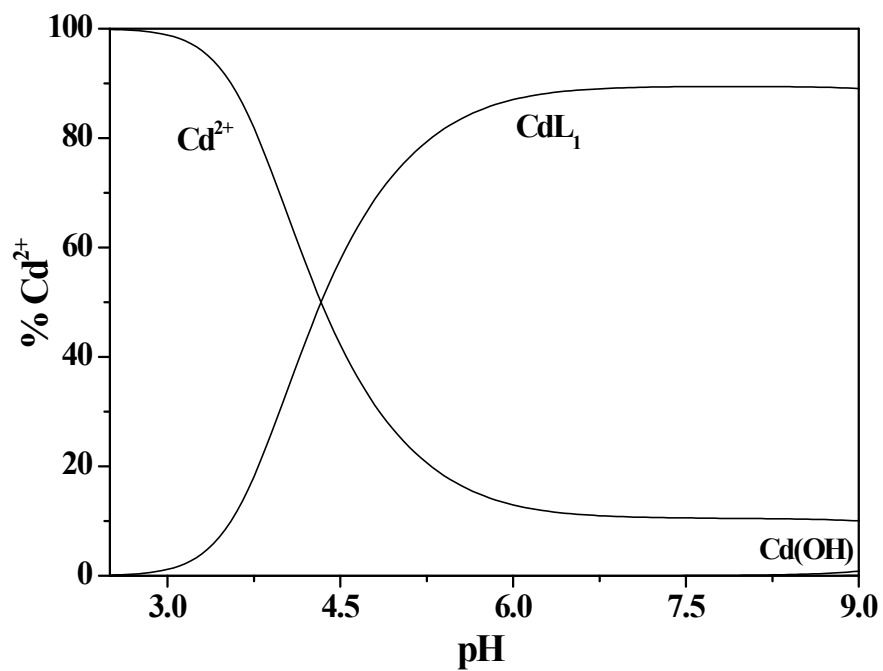


Figure 2S. Distribution diagram of Cd²⁺ leachate species vs. pH in NaCl, at $I = 0.1 \text{ mol dm}^{-3}$.
Experimental conditions: $C_{\text{leachate}} = 1 \text{ mmol dm}^{-3}$, $C_{\text{Cd}^{2+}} = 1 \text{ mmol dm}^{-3}$, $T = 298.15 \text{ K}$.

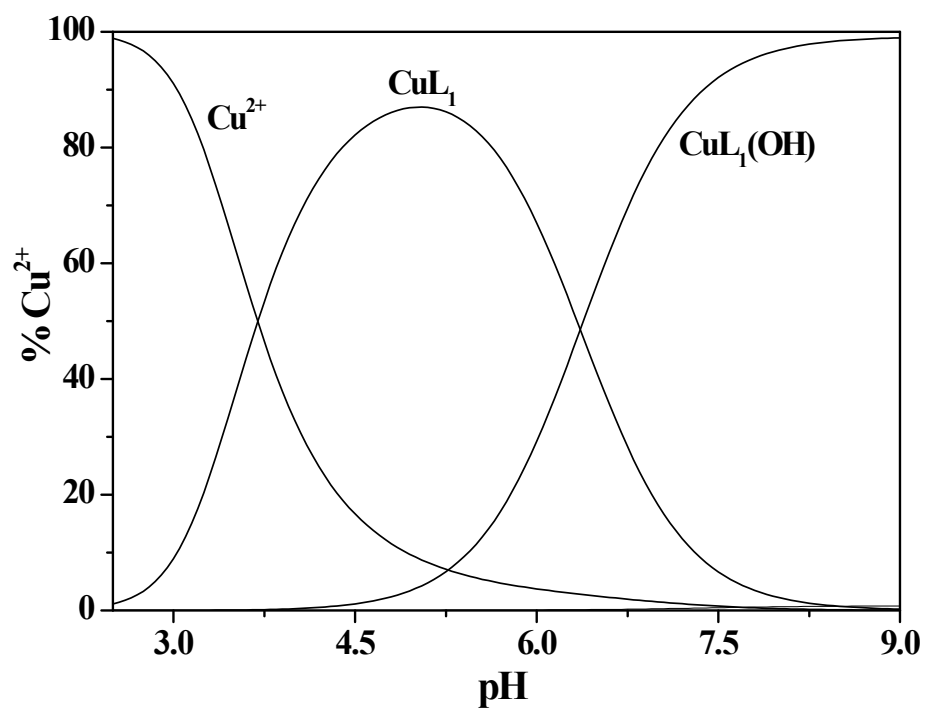


Figure 3S. Distribution diagram of Cu²⁺ leachate species vs. pH in NaCl, at $I = 0.1 \text{ mol dm}^{-3}$.
Experimental conditions: $C_{\text{leachate}} = 1 \text{ mmol dm}^{-3}$, $C_{\text{Cu}^{2+}} = 1 \text{ mmol dm}^{-3}$, $T = 298.15 \text{ K}$.

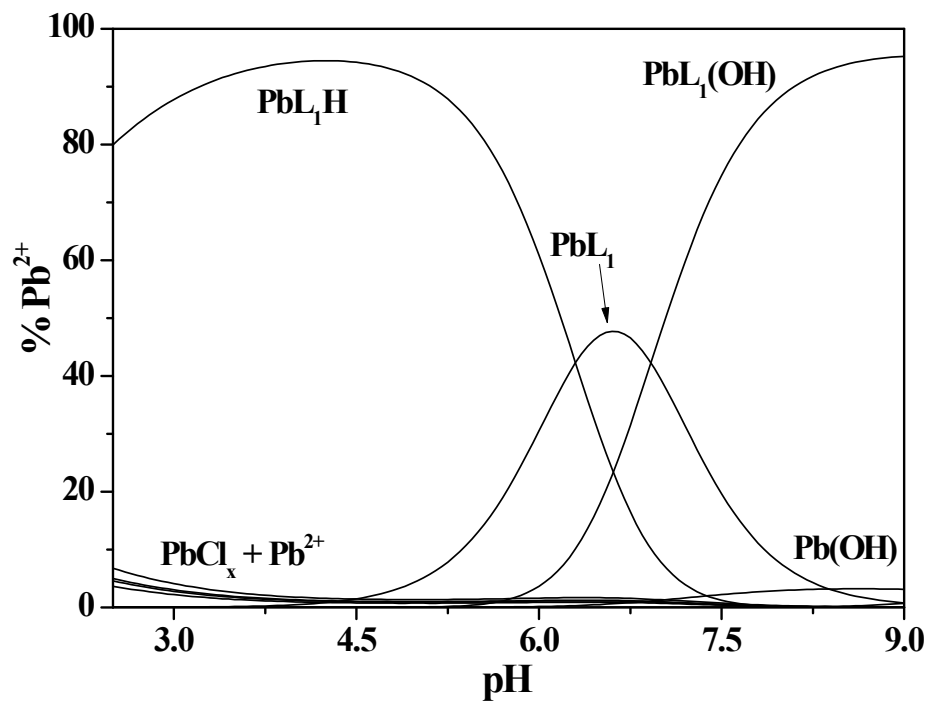


Figure 4S. Distribution diagram of Pb²⁺ leachate species vs. pH in NaCl, at $I = 0.1 \text{ mol dm}^{-3}$.
 Experimental conditions: $C_{\text{leachate}} = 1 \text{ mmol dm}^{-3}$, $C_{\text{Pb}^{2+}} = 1 \text{ mmol dm}^{-3}$, $T = 298.15 \text{ K}$.

Table 1S. Chemical characterization of landfill leachate of Bellolampo

Parameter	unit	value
pH		8.5 ± 0.2
Conductivity	μS cm ⁻¹	14300 ^a
Suspended solids	g dm ⁻³	1.11 ^a
COD	mg dm ⁻³	9330 ^b
NH ₄ ⁺	mg dm ⁻³	1790 (99) ^{b, c}
Total N	mg dm ⁻³	1650 (118) ^{b, c}
Cl ⁻	mg dm ⁻³	1760 ^b
Residue (<i>T</i> = 453.15 K)	g dm ⁻³	12.24 ± 0.05
Ash content (<i>T</i> = 823.15 K)	g dm ⁻³	9.67 ± 0.04
Al	mg dm ⁻³	2.424 ^d
Cr	mg dm ⁻³	0.503 ^d
Mn	mg dm ⁻³	0.056 ^d
Fe	mg dm ⁻³	1.887 ^d
Co	mg dm ⁻³	0.059 ^d
Ni	mg dm ⁻³	0.119 ^d
Cu	mg dm ⁻³	0.009 ^d
Zn	mg dm ⁻³	0.083 ^d
Cd	mg dm ⁻³	< 0.001 ^d
Sn	mg dm ⁻³	0.240 ^d
Pb	mg dm ⁻³	0.008 ^d

^a± 2 %, ^b± 5 %, ^c in parenthesis the mmol L⁻¹ of NH₄⁺ and of total N; ^d± 10 %