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Speciation of heavy metals in water from the Uganda side of Lake Victoria

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Pages 9-15 | Received 29 Sep 2009, Published online: 15 Feb 2010

 Download citation <https://doi.org/10.1080/00207230903371783>

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Abstract

Different forms of copper Cu, zinc Zn, lead Pb and cadmium Cd in water from the Uganda side of Lake Victoria (25°C, pH 6.75–7.18), the second largest inland freshwater lake in the world, have been studied using ion-exchange, dialysis and atomic absorption spectrophotometry. The results indicate that heavy metals Cu, Zn, Pb and Cd are present mainly in the cationic form (80–83%). Small quantities of anionic (13–22%), non-ionic, dialyzable (4–8%), and non-ionic, non-dialyzable (< 1.3–4.4%) forms were also detected for all metals except Cd. The corresponding concentrations lay in the ranges: cationic, 0.06–0.99; anionic, < 0.001–0.25; non-ionic, dialyzable, < 0.001–0.08; non-ionic, non-dialyzable, < 0.001–0.06 $\mu\text{g ml}^{-1}$. The existence of the metals in non-ionic and non-dialyzable forms is attributable to metal associations with high relative molecular mass (RMM) organic matters.

Keywords: Heavy metals, Speciation, Dialysis, Ion-exchange, Lake Victoria, Atomic absorption spectrophotometry

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