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TOXICITY OF ARSENIC AND MERCURY SPECIATION IN ACTIVATED SLUDGE

A. S. STASINAKIS, N. S. THOMAIDIS, A. S. GIANNES and T.D. LEKKAS

Laboratory of Water and Air Quality, Department of Environmental Studies, University of the Aegean, 17 Karadoni str., 81100 Mytilene, Greece

ABSTRACT

The inhibition effect of arsenite, As(III), arsenate, As(V), inorganic mercury, Hg(II) and methylmercury, MeHg, on the respiration rate of activated sludge heterotrophic microorganisms was evaluated. As(III) and MeHg were much more toxic on activated sludge than As(V) and Hg(II) respectively. The effect of various experimental parameters, such as sludge age, concentration of suspended solids and exposure time, on the toxicity was investigated. An increase of sludge age or the concentration of suspended solids reduced the observed inhibition. Longer exposure seemed to increase dramatically the inhibition of As(III), MeHg and Hg(II) during the first hours of exposure, while later the inhibition increases in a slower rate. On the contrary, in the presence of As(V), 24 hours after exposure, the respiration rate was similar to that of the control biomass.