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TOXIC PROPERTIES OF CYANIDE, CHROMIUM AND ORGANOTIN COMPOUNDS AND THEIR INTERACTIONS ON *DAPHNIA MAGNA*

A. KUNGOLOS[1], S. HADJISPIROU[2], M. PETALA[3], V. TSIRIDIS[3], P. SAMARAS[3] and G. P. SAKELLAROPOULOS[3]

[1]Department of Planning and Regional Development, University of Thessaly, 38334 Volos, Greece
[2]Laboratory of Inorganic Chemistry, Department of Chemical Engineering, Aristotle University of Thessaloniki, 54006, Greece
[3]Chemical Process Engineering Laboratory, Department of Chemical Engineering, Aristotle University of Thessaloniki and Chemical Process Engineering Research Institute
6th km Harilaou Thermi Road, 57001, Thessaloniki, Greece
[1]E-mail: kungolos@uth.gr

EXTENDED ABSTRACT

The toxicity of chromium, cyanide and two organotin compounds were investigated in this study on the freshwater crustacean *D. magna*. The substances examined for their toxic properties were: tin in the form of trimethyltin chloride (TMT) and of dibutyltin diacetate (DBT), chromium as potassium dichromate and cyanide as potassium cyanide. The toxicity of the tested substances was evaluated by the estimation of the EC_{50} value (the effective concentration of the tested substance that causes 50 % immobilization on *D. magna*). The range of concentrations used for the estimation of the EC_{50} values of the organotins compounds varied about two orders of magnitude and the corresponding value of chromium and cyanide varied one order of magnitude, indicating a steeper dose response curve of chromium and cyanide. Tin as trimethyltin chloride (TMT) was the most toxic compound with the lowest EC_{50} value, 0.15 mg/L, while the less toxic compound was cyanide with an EC_{50} value equal to 1.12 mg/L. The toxicity of the four compounds tested was in the order TMT>DBT>Cr>CN. The interactive effects between trimethyltin and chromium/cyanide and dibutyltin dichloride and chromium/cyanide on *Daphnia magna* were investigated and the experimental values were compared with the theoretical ones, obtained from a statistical analysis. In most cases experimental toxicity values of cyanide and tin mixtures were equal to the theoretically predicted ones and were associated with additive effects developed between the components of the mixtures. However, combined binary mixtures of chromium with both organotins showed generally antagonistic effects. Synergistic effects were observed only in the case of the binary mixture of tin as DBT and cyanide at high concentrations.

Key words: Toxicity, *Daphnia magna*, combined effects, organotins, chromium, cyanide