

[Appl. Organometal. Chem., 5, 83-90 (1991)]

[Lab. of Public Health]

### **Production of methyltin compounds related to possible conditions in the environment.**

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Ethanol, acetic acid and propionic acid abiologically methylated inorganic tin, and the highest yield of methyltin was observed in the reaction between inorganic tin (II) and ethanol. Furthermore, environmental factors for the methylation, such as pH, temperature, added ethanol concentration of sodium chloride and photoirradiation, were investigated in this reaction. Methyltin production increased at low pH, and decreased at higher concentrations of sodium chloride. Photoirradiation accelerated the reaction rate. Inorganic tin (II) was converted rapidly into monomethyltin, and gradually transformed into dimethyltin and trimethyltin with the course.

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[Lab. of Public Health]

### **Structure-activity relationships for organotin compounds on the red killifish *Orizias latipes*.**

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The LC<sub>50</sub> values of a series of 29 organotin compounds were determined for the red killifish (*Oryzias latipes*) according to an OECD test guideline. Their toxicities varied from 10<sup>-1</sup> to 10<sup>-5</sup> mmol/dm<sup>3</sup> in five orders of magnitude. A quantitative structure-activity relationship (QSAR) study of these organotin compounds was carried out. The new parameter, Index Value (IV) which is created and defined by the number of phenyl or alkyl groups attached to the tin atom gave excellent regression equations to predict the toxicities of organotin compounds. A multiparametric relationship including IV, Information Index and Mean Information Index showed the best correlation.

[Gypsum & Lime, 233, 233-239 (1991)]

[Lab. of Public Health]

### **Simulation Model in Solubilization of Lime-Based Amendment and pH Increase as a Results of Interactions with Natural Water.**

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Simulation of hydroxyl ion in water after liming was carried out with the model derived from the material balance of hydroxyl ion. Hydroxyl ion balance could be explained by the equation,  $V \cdot dC/dt = K_1 \cdot f \cdot A - Q \cdot C - K_2 \cdot C \cdot V$  in which V, C, K<sub>1</sub>, f, A, Q and K<sub>2</sub> represent water volume (ℓ), concentration of hydroxyl ion (equ/ℓ), release rate of hydroxyl ion by lime (equ/m<sup>2</sup>/day), coverage percentage by lime (%), bottom area (m<sup>2</sup>), flow rate (ℓ/day) and uptake rate of hydroxyl ion by Mg<sup>2+</sup> (1/day), respectively. Parameters needed for simulation, K<sub>1</sub>, K<sub>2</sub> and f, were measured by flowthrough apparatus empirically.

A proposed model was successfully tested with the data obtained from Oota River in Kouchi Prefecture and Kuwabara River in Gifu Prefecture where lime was applied.