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### Quantitative Structure-Activity Relationships in *Tetrahymena* Toxicity Studies.

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Regression analysis was carried out in order to predict the effective concentration (EC<sub>50</sub>) of 34 chemicals for inhibition of *Tetrahymena pyriformis* in 24hr. We examined 4 items [n-octanol/water partition coefficient (*P*), Molecular (*Mr*), organic and inorganic characters and molecular connectivity index ( $\chi$ )] and their derivatives. The best one-parameter equation was ;  $Mr$  [ $\log EC_{50} = -1.964 (Mr/100) + 5.380$  ( $r = -0.821$ )], and the second one was ; [ $\log EC_{50} = 1.108^3 \chi_p^y + 3.944$  ( $r = -0.810$ )], while the n-octanol/water partition coefficient was least effective ( $r = -0.780$ ). The best two-parameter equation was ; [ $\log EC_{50} = -1.105 (Mr/100) - 0.638^3 \chi_p^y + 4.990$  ( $R = 0.866$ )]. Regression analysis with the same 4 items on median lethal concentration of 123 chemicals for *Oryzias latipes* was referred, and the limitations in the application of the parameters and the equations obtained were discussed.

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### Odor Emitting Mechanism and Its Actual Condition at the Waste Disposal Site.

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At the disposal site of solid waste, methane-containing gases are emitted from many gas wells. The actual conditions of odor emission have not been investigated in detail. Therefore, a test of methane fermentation using refuse and sewage was carried out and a field survey for the gas emitted at a disposal site was made during approximately five years. In the fermentation test, sulfur-containing odorants in the gas were detected at high value during a few days from the start. For example, concentration of hydrogen sulfide, methyl mercaptan and dimethyl sulfide were respectively 29.0 ppm, 82.2 ppm, and 89.6 ppm at the fourth day. In the field survey, above-mentioned odorants were mostly contained in the gases from gas wells. These concentrations were extensively varied at each point of the well and at each surveyed time.

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### Anaerobic decomposition of activated sludge.

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The anaerobic decomposition of sludge was investigated. With the decrease of ORP, pH increased and MLSS decreased. BOD value of supernatant was larger than COD value, but the ratio of both values was not constant. Acetic and propionic acids were detected in a large amount as volatile acids. As N compounds, NH<sub>3</sub>-N was much, but NO<sub>2</sub> and NO<sub>3</sub>-N were contained a little. As P compounds, orthophosphate form was much and organic form was a little. As sulfides in sludge, combined form was much and free form was a little, while a large amount of sulfate-S was contained in filtrate. For gas production by unacclimatized sludge, the large production periods were observed at four times. CH<sub>4</sub> and N<sub>2</sub> were much, while H<sub>2</sub> and H<sub>2</sub>S were a little. If digested sludge was mixed, the gas production decreased and only one production period was observed.