

Thesis Title Comparision of Leachate Characteristics from
Anaerobic and Semi-aerobic Landfills

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Abstract

The objective of this study was to compare the leachate characteristics from anaerobic and semi-aerobic landfills by using two lysimeters with 1.2 m in diameter and 3.4 m in height. The difference between two lysimeters is leachate collection pipe. Semi-aerobic lysimeter has larger leachate collection pipe that was opened all the time in order to allow air entering the bottom part of lysimeter. Each lysimeter was filled with 2,246 kg of Chiang Mai municipal solid wastes with in-placed density of 622 kg/m^3 .

The experiment had been conducted since March until October in 1993. The quantity and the following parameters: pH, alkalinity, acidity, conductivity, total solids, total volatile solids, Org-N, $\text{NH}_3\text{-N}$, $\text{NO}_{2,3}^- \text{-N}$, Cl^- , volatile acid, COD, BOD and TOC were determined.

Leachate production were in the range of 0.2 - 35.1 l/d and 0.33 - 21.1 l/d for anaerobic lysimeter and semi-aerobic lysimeter, respectively. At the first day, leachate produced from both lysimeter contained high concentration of pollutants. One week later, almost pollutant concentrations in the leachate produced from semi-aerobic lysimeter were significant lower than pollutant concentrations in the leachate produced from anaerobic lysimeter. Leachate produced from semi-aerobic lysimeter was slight base while leachate produced from anaerobic lysimeter was slight acid. In addition, it was investigated that the concentration of pollutants in the leachate produced from semi-aerobic lysimeter were increase after raining.

The results of gel filtration chromatography of the leachate from semi-aerobic lysimeter showed that the molecular weight distribution consisted of 2 main groups. After 27 days of filling age that was in dry season, it was investigated that the low molecular weight fraction contained much lower values of TOC and absorbance at both 220 and 254 nm. However, in the rainy season,

TOC and absorbance values of the low molecular weight fraction became higher. In case of the molecular weight distribution of the leachate from anaerobic lysimeter, it was found that there were two main groups which contained nearly constant values of TOC and absorbance both at 220 and 254 nm throughout the experiment period.

It was concluded that semi-aerobic lysimeter generated leachate containing lower concentration of pollutant than anaerobic one.