

Evaluation of Simple Random, Systematic and Composite Sampling Methods for Industrial Waste Analyses

張怡怡

Chang EE;Chiang PC;Chiang YC and Lu PH

摘要.

Abstract

The leather debris, textile and electroplating sludge were selected as the representative industrial waste to perform the sampling and TCLP tests in this investigation. Three typical sampling methods i.e., simple random sampling (SRS), systematic sampling (SYS) and composite sampling (CPS) were introduced to evaluate how they can effectively obtain the representative sample to meet the analytical precision and EPA regulation requirements. The statistical techniques including Shapiro-Wilk (W-test), Notched Box-and-Whisker diagram and Kruskal-Wallis (K-W test) were used to provide the criteria for further evaluations.

The results of the simulated experiment indicate that SRS method is not suitable for use when a disposal site of industrial waste is stratified. However, for those solid wastes without clear stratification, the SRS, SYS and CPS methods do not differ too much. In practice, a two-stage or three-stage sampling method may be utilized to reduce the variation, if the background information of the solid wastes is not clearly known.