

US EPA ARCHIVE DOCUMENT

Importance of Leaching Tests

Ishwar P. Murarka

Ish Inc.

Leaching Tests

- Laboratory Batch Equilibrium
- Laboratory Column
- Partitioning/Distribution Coefficient Based
- Solubility Based
- Field Porewater Composition

Purpose of Leaching Tests

- To obtain aqueous phase concentration(s) of constituent(s) which are released from solids when placed in a land disposal unit(s)

Importance and Methods

- Leachate concentration(s) constitute the source term for transport and fate in the environment and, therefore, the associated risk(s)
- There are many laboratory leaching tests that have been reported in the literature
- ASTM has developed standard leaching tests which use alternate leaching fluid with very little additional difference in the test methodology

Importance and Methods

(continued)

- The USEPA has two regulatory tests for the classification of solid wastes under RCRA. These tests are:
 - TCLP
 - SPLP
- Both of these tests are expected to simulate leaching of solid wastes placed in a municipal landfill
- In adopting these two tests, EPA focused on the characteristics of the leaching fluid that resembles a municipal landfill leaching environment

Importance and Methods

(continued)

- These two tests have been widely used to generate leachate concentrations for all types of solids for a number of metals and organic chemicals
- These two tests are not applicable to obtaining leachates for monofills and surface impoundments
- However, over the last ten years or so, issues have arisen because of the much broader use of the TCLP & SPLP test methods

Importance and Methods

(continued)

- Leaching potential for the same chemical can be quite different depending on a number of factors such as characteristics of the leaching fluid, form of the chemical in the solids, and the disposal conditions

Factors Affecting Leaching of Inorganics

For most inorganics the controlling factors for leaching are:

- pH
- Redox conditions
- Solid to liquid ratio for extraction
- Solubility
- Solid phase compound

Factors Affecting Leaching of Organics

For most organic chemicals the controlling factors for leaching are:

- Solubility
- Partitioning
- Presence of organic carbon
- Solid to liquid ratio for extraction
- Non-Aqueous phase liquid

Some Examples