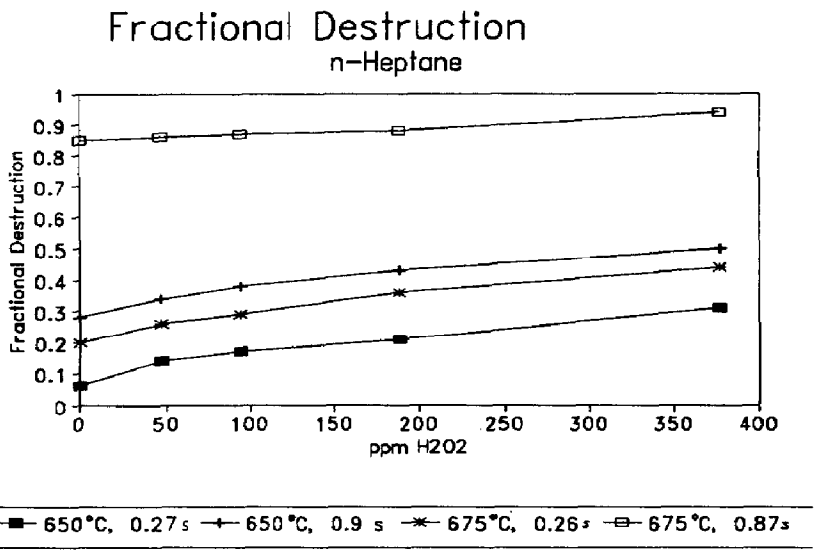
hydrogen peroxide in water were injected into the flowing air stream at various



molar ratios of H_2O_2 to VOCs. A number of trials were made to determine global destruction kinetics for two VOCs — heptane and isopropanol. Temperatures studied ranged from 650 °C to 700 °C and residence times varied from 0.25 to 1.0 seconds. It was shown that H_2O_2 definitely increased the rate of destruction of the primary organics. However, at the residence times and temperatures studied, both organic intermediates and CO persisted. A surprising experimental result was that position of the H_2O_2 injector relative to the reaction zone made a dramatic difference in the results. Results obtained for n-heptane destruction under various conditions are shown above, for example.

Evaluation of alternative leachate liner materials

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Abstract

Multi-component liner systems consisting of clay and synthetic Flexible Membrane Liners (FMLs) have been shown to be inadequate in preventing leaching of hazardous compounds from landfill facilities. Significant quan-

tities of leachate materials are allowed to escape due to cracks or diffusion through the clay liner, and FMLs have been shown to fail due to flaws in the FML or diffusion through the FML. The failure of these liner systems creates the potential for contamination of groundwater or adjacent soils.

The objective of this research is to evaluate the effectiveness of several alternative liner materials for use in landfills based on the material's ability to absorb selected organic compounds, availability, and expense with respect to large scale operations. These liner materials include peat moss, compost, activated carbon from cotton gin trash, lignite, and granular activated carbon for comparative purposes. Organic compounds were selected based on chemical characteristics and to represent a range of compounds potentially found in landfill leachate. These test compounds include acetone, 2,4-dichlorophenol, benzene, toluene, trichloroethylene, and tetrachloroethylene.

Isotherm experiments were used to evaluate partition coefficients for each test compound and selected mixtures with the liner materials. The isotherm experiments were also used to evaluate the effects of moisture content on liner material performance, quantify synergistic or antagonistic interactions between the compounds and their mixtures, and evaluate physical/chemical alterations to the liner materials as a function of exposure to the test compounds. Breakthrough experiments characterized dispersive and advective transport parameters, determined the effects of moisture on flow through a soil column, and finally determined liner materials with potential for value in landfill designs.

Feasibility of extracting lead, cadmium, mercury, copper and zinc from soil using anhydrous ammonia

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Abstract

An innovative anhydrous ammonia extraction process for removing toxic metals from contaminated soil is under investigation. Results to date indicate that cadmium, mercury, copper, and zinc can be extracted from contaminated soil using anhydrous ammonia alone. Lead can be removed using anhydrous