

mobile pore water in the unsaturated zone; and (13) liquid in rock fractures (either zone).

The remainder of the book consists of a chapter addressing each of the thirteen locations/states. The chapters are developed around a set format beginning with a description of the subject locations/state and a discussion of the fate and transport phenomena that will determine the effectiveness of remediation. Equations are provided to numerically describe phase transfer and transformation processes. Tables are included providing the input data for gasoline chemical constituents to be used in the equations. Means of estimating the average and maximum storage capacity in the location are presented along with example calculations. The chapters conclude with a summary of the relative importance of the location/state to overall remediation. In addition to being a good text on fate and transport mechanisms, the book is an excellent reference on the properties of common gasoline constituents. I recommend the book to anyone who deals with the fate, transport and/or remediation of gasoline releases.

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*Bioremediation of Hazardous Wastes*, by Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., Report No. EPA/600R-92/126, August 1992, 119 pp. (No price/no ISBN.)

This short book contains synopses of papers presented at the U.S. EPA's Fifth Annual Symposium on Bioremediation of Hazardous Wastes. The symposium was held in Chicago, Illinois in May 1992. Presented were 28 papers and 9 poster exhibitions, reporting on recent U.S. EPA bioremediation research program achievements and results of research projects aimed at bringing bioremediation into widespread use.

The proceedings are comprised of an executive summary, an introduction and then brief summaries of the papers and poster presentation categories as follows:

1. Site Characterization (4 entries): The four papers discuss research on petroleum spill cleanup, the efficiency of *Pseudomonas* bacteria to remediate chemical contamination, and on constraints to the proposed use of methane-oxidizing bacteria for a TCE plume.
2. Bioremediation Field Introduction (10 entries): The eight papers and two poster exhibits covered the field evaluations underway at sites utilizing bioventing, biochemical techniques, and bioremediation under a variety of aerobic and anaerobic conditions.
3. Performance Evaluation (4 articles): The topic deals with the development of bioremediation approaches that protect public health. The four papers presented discuss the risks related to bioremediation and potential genotoxicity.

4. **Research; including laboratory, pilot-scale, and field research (16 articles):** The eleven papers and five poster presentations are in a topic area that focuses on identifying microorganisms that can degrade contaminants as well as developing new biosystems for treatment of pollutants in surface waters, sediments, soils, and subsurface material.
5. **Modeling (3 articles):** Two presentations concern the mechanisms by which granulated microbial activated carbon systems degrade hazardous wastes; third presentation deals with biodegradation kinetics.

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