have been measured for a series of typical aromatic contaminants (benzene, *m*-cresol, *p*-chlorophenol, phenol), both in the ternary system and in systems containing several aromatics. The results were accurately modeled using a perturbation theory-based equation of state of the Carnahan–Starling–DeSantis–Redlich–Kwong type. In some cases it was shown that pure component solubilities in supercritical CO_2 could be used as a basis for estimating distribution coefficients between water and CO_2.

The oxidation of supercritical mixtures containing extracted aromatics was also studied, by adding the necessary amount of air (equivalence ratios near 1) and contacting this mixture with various mixed-metal oxide catalysts. Typical reaction conditions were $P = 80$–200 bar and $T = 393$–573 K. Over this range both partial and total oxidation were possible. By holding temperature and composition constant, but varying pressure, it was determined that fluid-phase reactions do take place (as evidenced by measurement of an activation volume), but that the reactions are not diffusion-limited. Overall rates were enhanced by the catalysts, as was demonstrated by comparing Pt-based catalysts to those containing Ni, Co, or V. Rates comparable to oxidation in supercritical water can be obtained, but at lower temperature.

Technological innovation in hazardous waste treatment and disposal

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Abstract

Innovation is a highly desirable process in the field of hazardous wastes. The high cost of disposal with current technologies impedes the cleaning of old sites

and encourages illegal dumping. New technologies are needed to solve this nation's problems. However, the impediments to innovation are high. Regulations in the environmental laws make permitting of innovative technologies difficult. The technical innovators are hampered by complex regulations, questionable insurability, and public concerns about safety. The public perception is that innovative technologies imply greater risks; and feed into the NIMBY (not in my backyard) syndrome. The overall result is a significant barrier to the introduction of innovative technology.

A proposal for the salt dome disposal of hazardous wastes at a site near Houston, Texas, is used to illustrate the technical, legal, and social impediments to innovation. Although the proposal is clearly innovative, the company applying to the State of Texas for a permit has attempted to fit their concept into current slots and downplay any innovative aspects of their technology. The strategies are delineated in the paper.

The overall conclusions are that in the heavily regulated environments of hazardous waste management innovative technologies are difficult to implement. As a consequence, the pipeline to deliver innovations is sealed off at the end.

Testing for waste degradation during deep well injection

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Abstract

Deep-well injection of chemical wastes into saline formations is a common method of waste disposal in the Texas Gulf Coast. Four lines of evidence suggest biodegradation may be altering the organic wastes to nontoxic materials. Naturally occurring organic materials (oils and organic acid anions) show evidence of degradation. Degradation of carboxylic acids, acrylonitrile, cyanide, and methyl alcohol has been demonstrated during injection at depths of approximately 1,000 ft (300 m). Chemical injection wells typically exhibit decreases in injectivity (injection rate/surface injection pressure) and require frequent acidization, suggesting formation plugging by microbial processes. Injection wells commonly fill over time, with deposits composed of calcium car-