Photodegradation, biodegradation and chemical fixation of pentachlorophenol (PCP)

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Abstract

A number of methods are being investigated in our laboratory for disposal and degradation of PCP and other toxic compounds. Upon photoexcitation PCP undergoes degradation. In homogeneous solutions the products are complex. But PCP solubilized in microheterogenous media (surfactant micelles and microemulsions) was found to absorb at higher wavelength and to degrade into carbon dioxide and water. In biodegradation PCP was converted into lower chlorinated phenols. The bacteria which caused degradation occur naturally. In chemical fixation, cement was used for stabilizing PCP. It is found that about 97% PCP can be retained by cement matrix. Spectroscopic (FT-IR, UV-VIS) and Chromatographic (GPC) techniques were used in this work.

Quality assurance management plan for the gulf coast hazardous substance research center

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Abstract

Essential elements of the Quality Assurance Management Plan of the Gulf Coast Hazardous Substance Research Center will be presented. Specific as-

pects of a QA Project Plan which are particularly important in assuring the collection of defensible data will be emphasized. Topics such as SOP Manuals, laboratory notebooks, instrument logs, personnel qualifications and training, frequency of duplicates and spikes, and audits will be covered. Questions will be welcomed.

Rate order modelling of *in situ* extraction of volatile organic compounds from porous media

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Abstract

The ability to fit rate order models to the concentration vs. time data obtained from the extracted air stream of a bench scale soil *in situ* extraction apparatus was investigated. The extraction system model consisted of a 12 quart pail in which a porous media, either soil or utility sand, was placed around a small extraction tube. Water and a specific VOC were mixed in the media to simulate a contaminated field situation. The tube was connected to a vacuum system which caused air flow through the media. The concentration of the VOC in the extraction air flow stream was monitored using a flame ionization detector on a gas chromatograph. Porous media, VOC, and flowrate were varied to determine their effects on the rate order modelling.

In applying rate order models to the collected data, it was found that a 3/2 order model best fit the data collected from the highly permeable sand and a zero order model best fit the early data for the less permeable soil. For zero order behavior (soil) the regressions for the rate equations showed uniformity with flowrate and variation with compound. For 3/2 order behavior (sand) the opposite was true — the regression coefficients showed uniformity between compounds and variation between flowrates.

Preliminary fits to actual field data show good agreement for the 3/2 order model and it is recommended that further investigation be conducted into this area.
