

The Fate of Chloroethene in Geo-environment

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Chloroethene, also has the names of chloroethylene, ethylene monochloride, vinyl chloride monomer (VCM) or vinyl chloride (VC), is an important chemical substance widely used to produce polymer polyvinyl chloride (PVC) in plastic industry. Due to its high volatility, the pollution induced by the use of chloroethene itself is principally limited to air pollution. In geo-environment, such as soils and groundwater, the occurrence of chloroethene is mainly from biodegradation of its parent compound, like *cis*-Dichloroethene (*cis*-DCE), *trans*-DCE or 1,1-DCE, an intermediate product of biodegradation of trichloroethylene (TCE) and/or tetrachloroethylene (PCE). Either TCE or PCE has been widely used as an industrial solvent both in developed and developing countries.

To understand the fate of chloroethene in geo-environment, this presentation overviews the pathways, microorganisms, and degrading rates associated with biodegradation of chloroethene, the pollutant newly specified by the Japanese Soil Contamination Countermeasures Act. In natural environment, biodegradation of chloroethene is very slow and distribution of chloroethene around or downstream a source of pollution is dominantly affected by advection and dispersion. An advection-dispersion equation and sensitive analysis were, therefore, used to examine possible distances of chloroethene which may spread downstream of a source point over long time period. The control of groundwater flow can be an effective countermeasure against further spreading of pollutant plume.

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