

Toxic compounds in groundwater

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Vinyl chloride is a cancer-causing compound formed from solvents in groundwater systems under anaerobic conditions. These solvents are used in many industrial applications around the world and often belong to the most encountered groundwater pollutants in industrialized countries. Groundwater is a major drinking water resource, and it is vital to determine if vinyl chloride can be further degraded into harmless compounds.

A group of scientists at Ecole Polytechnique Fédérale de Lausanne (EPFL) and the University of Neuchâtel, Switzerland, has studied the degradation of the toxic compound in a laboratory setting mimicking a natural groundwater system. This work has been funded by the Swiss Federal Office for Education and Science within the framework of the EC Environment/Water Program.

In this experiment, solutions containing vinyl chloride, as well as some mineral salts, were pumped through laboratory columns. The toxic compound was regularly analyzed in inlet and outlet samples. After several weeks of cycling, vinyl chloride concentrations began to decrease, reaching zero after about four months. Ethene, an organic compound often used as a plant hormone, is one of the possible degradation products.

Christof Holliger, Director of the EPFL laboratory, explained that ethene's outlet concentration was always lower than the inlet vinyl chloride concentration.

The complete results from this study were published in the May-June 2011 issue of *Journal of Environmental Quality*.

More information: www.agronomy.org/publications/...eq/articles/40/3/915

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