

Pollution by Organic Chloride Compounds in Groundwater Circulation

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The physical property of Tri-chloroethylen as an example of organic chloride compounds is heavy, of which molecular weight is 131.4 and specific gravity is 1.5. The steam pressure of the compounds is 47.3, which is 3 times of water and the solubility is 1,100 mg/l which is infusible. The coefficient of viscosity is 0.56×10^{-3} Pa s and the surface tension is 0.003 N/m which are less than half of water.

By these physical properties the undiluted solution of organic chloride compounds in the unsaturated zone which subsist arborescencely, infiltrate osmotically evaporating to gaseous vapors. The compounds infiltrate through groundwater table and arrive on the bottom of the aquifer forming the pool. As infusible, the compounds exist for long years forming the pool of the undiluted solution in the aquifer near the pollution sight.

Under the anaerobic condition, a part of Tetra-chloroethylen C_2Cl_4 changes to Tri-chloroethylen HC_2Cl_3 , and Di-chloroethylen $H_2C_2Cl_2$, taking away chlorine one by one. The reaction system advances in the extreme slowly.

Groundwater pollution becomes an issue evidently around the site in the discharge area, as dissolved contaminant groundwater spring out to the surface.

In recharge area, as organic chloride compounds and dissolved contaminant groundwater infiltrate deeply, groundwater pollution is inconspicuous. In recharge area it is frequently happened to leave the pollution of groundwater intact. As time goes by, the groundwater pollution increasingly extends deeply and widely.

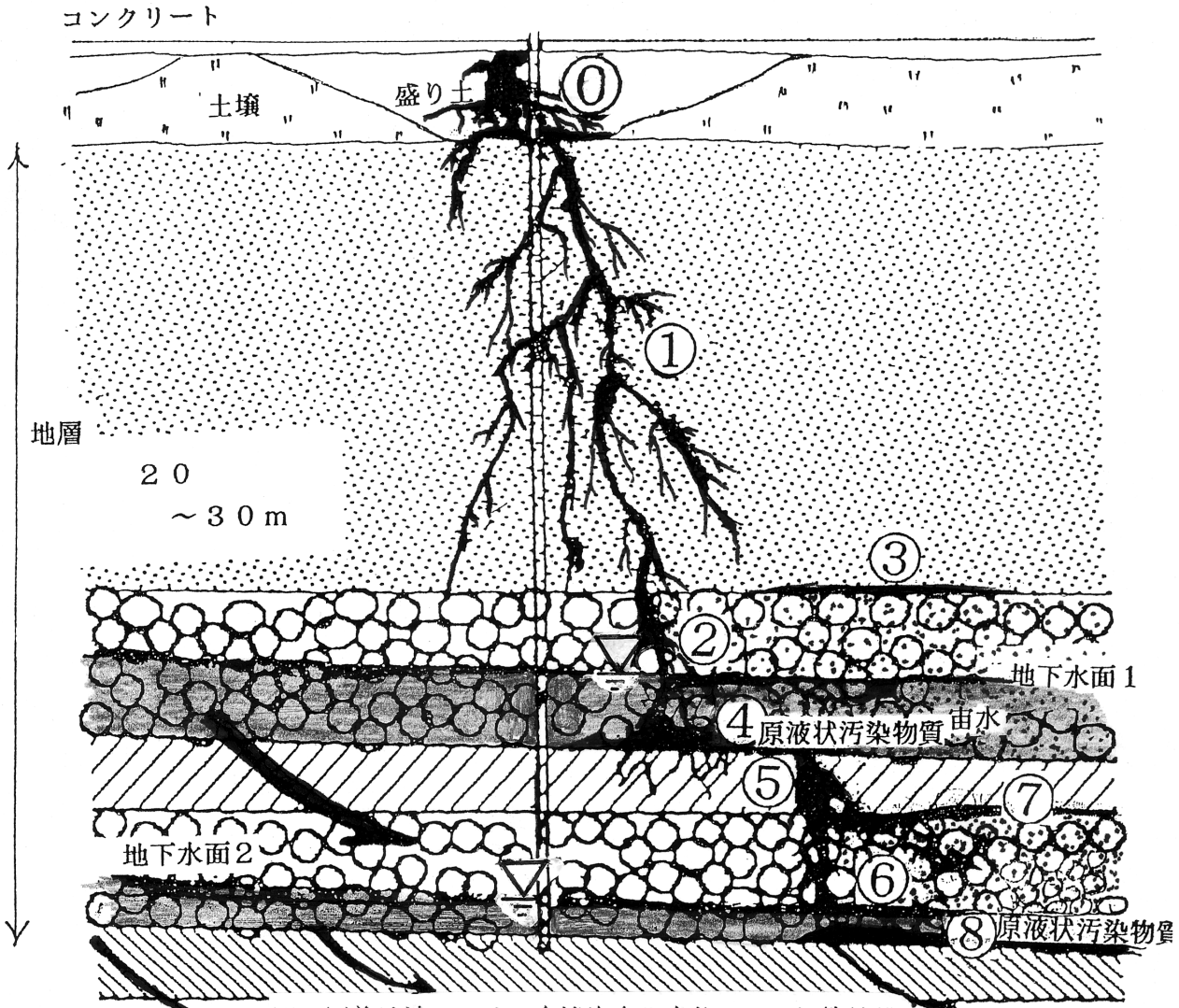


図 涵養地域における有機塩素化合物による汚染機構

(長瀬ほか1995に加筆)

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