

NUMERICAL STUDY FOR RISK ASSESSMENT ON SOIL CONTAMINATION DUE TO MINERAL OIL

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In late years, soil contamination due to mineral oil in vacant lots of oil factory and oil field has become obvious. Measure for soil contamination and risk assessment are necessary for sustainable development of industrial activity. Especially, in addition to contaminated sites, various exposure paths for human body such as well water, soil and farm crop are supposed. So it is very important to comprehend the transport phenomena of contaminated material under the environments of soil and ground water. In this study, mineral oil as contaminated material consisting of multi-component such as aliphatic and aromatic series was modeled. Then numerical model for transport phenomena in surface soil and aquifer was constructed. On the basis of modeling for mineral oil, our numerical model consists of three-phase (oil, water and gas) forty three-component. Furthermore, relative permeability as a parameter for multi-phase flow was experimentally measured and formulated as a function of specific gravity of oil and soil particle size. Using the developed numerical model, we carried out some numerical simulation for risk assessment on soil contamination due to mineral oil. Kinds of oil and soil were changed as a calculation parameter in order to evaluate the degree of risk due to intake of groundwater.

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