

Geo-Pollution Science, Medical Geology and Urban Geology

Vol.2 No.4 2006

Contents

Review

- 98 **Bioremediation of subsurface contamination with volatile chloro-organic compounds (VCOCs) using methane-oxidizing bacteria**
-Trend in bioremediation-
Mio TAKEUCHI, Kenji NANBA, Ken FURUYA, Osamu KAZAOKA, Takeshi YOSHIDA, and Takeshi KOMAI

Report

- 110 **Man-made strata and prediction of earthquake disasters in Niigata City, central Japan**
Takao NAKAGAWA

News

122

Bioremediation of subsurface contamination with volatile chloro-organic compounds (VCOCs) using methane-oxidizing bacteria -Trend in bioremediation-

Mio TAKEUCHI¹, Kenji NANBA², Ken FURUYA³, Osamu KAZAOKA⁴, Takeshi YOSHIDA⁴, and Takeshi KOMAI¹

1: Institute for Geo-Resources and Environment, National Institute of Advanced Industrial Science and Technology (AIST)

16-1, Onogawa, Tsukuba, Ibaraki 305-8569 JAPAN

2: Department of Science and Engineering, Fukushima University 1, Kanayagawa, Fukushima 960-1296 JAPAN

3: Graduate School of Agricultural and Life Sciences, The University of Tokyo 1-1-1, Yaoyoi, Bunkyo, Tokyo 113-8657 JAPAN

4: Research Institute of Environmental Geology, Chiba 3-5-1, Inagekaigan, Mihama-ku, Chiba 2261-0005 JAPAN

Abstract

Volatile chloro-organic compounds (VCOCs) such as trichloroethylene, is a major subsurface contaminant all over the world. Various microorganisms including aerobic and anaerobic bacteria, have been reported to degrade VCOCs. Among them, methane-oxidizing bacteria (methanotroph), which utilize methane as the only carbon and energy source, are one of the major players in bioremediation of VCOCs contamination because of a safety of their substrate, methane. Therefore, several bioremediation studies such as biostimulation and bioaugmentation using methanotrophs have been reported to date. Recently, a new style of bioremediation, priming bioaugmentation, was also suggested for remediation such that used methanotrophs naturally occurring in methane-rich ground water. In this article, we review various bioremediation studies using methanotrophs.

Keyword: Bioremediation, Methanotrophs, VCOCs, Biostimulation, Bioaugmentation, Priming bioaugmentation

Man-made strata and prediction of earthquake disasters in Niigata City, central Japan

Takao NAKAGAWA

3-41, Sasaguchi, Niigata 950-0911, Japan

Abstract

Man-made strata which consist of fillings, landfills, etc. are widely distributed in cities and their vicinities of Japan, and have frequently suffered from earthquake disasters. In 1964, the Niigata Earthquake ($M = 7.5$) hit Niigata City, situated on low-lying Niigata Plain, and caused considerable damages such as sinking and inclination of buildings, breakdown of bridges, inundation to lowland, and fire of plant for petroleum refining. The damage of buildings and bridges resulted from liquefaction of the ground, and the areas were restricted in abandoned channel and reclaimed land. Taking landform classification, subsurface geology, distribution of man-made strata and damage due to the Niigata Earthquake into consideration, earthquake disasters such as liquefaction and inundation in the city are predicted, and the risk of disasters is expressed with values. The risk established is presumably valid because a significant correlation between the amount of damage of 44 schools due to the Niigata Earthquake and the values of their sites is recognized.

Key word: Man-made strata, Niigata Earthquake of 1964, Liquefaction, Prediction of earthquake disasters, Niigata City