

Evaluations of MTBE Natural Attenuation Potential : Lab-Scale Batch Study of the Gasoline-Contaminated Site Soils under Various Reducing Conditions

Kyu-Hyun Lee · Si-Jin Lee · Soon-Woong Chang

¹Department of Environmental Engineering, Kyonggi University
e-mail: seen095@hanmail.net

ABSTRACT

Oxygenates, mainly methyl *tert*-butyl ether (MTBE) are currently the most commonly used ether oxygenate due to its high octane properties and high combustion efficiency. However, MTBE containing ether bonds has shown limited degradation in the environment. MTBE has a very high solubility in water and mobile compound that generates long pollution plumes in aquifers impacted by gasoline releases from leaking tanks.

This study, we investigated whether MTBE removal can be enhanced under various anaerobic electron-accepting conditions in gasoline contaminated site soils. The objectives of this study are therefore as follows: (1) to estimate of anaerobic biotransformation MTBE by indigenous microcosms from five different site soils under nitrate-reducing, sulfate-reducing, and iron-reducing conditions and (2) to evaluate the natural attenuation potential of the gasoline-contaminated site soils.

The results indicated that indigenous microcosms from gasoline contaminated site soils were enhanced and continued MTBE biodegradation and TBA observation was supported MTBE biodegradation under various kinds of anaerobic electron accepting conditions. Batch experiments suggested that Anaerobic biotransformation of MTBE depended on various pattern of the biological removal of MTBE under enhanced nitrate reducing, sulfate-reducing, and iron-reducing conditions.

Key words: MTBE, Natural attenuation potential, electron accepting conditions