



## Application and development of isotope analytical methods to remove volatile organic contaminants

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Our chemical-biological basic research aims to eliminate chlorinated environmental contaminants from aquifers around industrial areas in the frame of research program supported by the European Social Fund (TÁMOP-4.2.2.A-11/1/KONV-2012-0043). The most careful and simplest ways include the in situ biodegradation with the help of cultured and compound specific strains and the in situ chemical oxidation/reduction. Several methods were investigated to estimate the rate of in situ biodegradation or chemical oxidation/reduction, such as the measurement of the concentration of the pollutant along the contamination pathway, the micromosmos studies or the compound specific stable isotope analysis. In Hungary, we are pioneers in the stable isotope monitoring of biodegradation and oxidation/reduction reaction of dehalogenation. The main goal is to find stable isotope fractionation factors by stable isotope analysis ( $\delta^{13}\text{C}$ ), which can help us to estimate the rate and effectiveness of the biodegradation and the chemical dehalogenation process. The subsequent research period includes the investigation of the method, testing its feasibility and adaptation in the environment. Last but not least, the research gives an opportunity to identify the producer of the contaminant based on the stable isotope composition of the contaminant.