



## **Monitoring of the aerobic biodegradation of chlorinated organic solvents by stable isotope analysis**

Anikó Horváth, István Futó, and László Palcsu

Hungarian Academy of Sciences Institute for Nuclear Research, Section of Environmental and Earth Sciences, Debrecen, Hungary (horvath.aniko@atomki.mta.hu)

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 way includes the in situ biodegradation with the help of cultured and compound specific strains. Numerous members of *Pseudomonas* bacteria are famous about function of bioremediation. They can metabolism the environmental hazardous chemicals like gas oils, dyes, and organic solvents. Our research based on the *Pseudomonas putida* F1 strain, because its ability to degrade halogenated hydrocarbons such as trichloroethylene. Several methods were investigated to estimate the rate of biodegradation, such as the measurement of the concentration of the pollutant along the contamination pathway, the microcosm's studies or the compound specific stable isotope analysis. In this area in the Transcarpathian basin we are pioneers in the stable isotope monitoring of biodegradation. The main goal is to find stable isotope fractionation factors by stable isotope analysis, which can help us to estimate the rate and effectiveness of the biodegradation. 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.