

## **Dr. TOMASZ KUDER**

**Founder of KUDER ENVIRO-ISOTOPES LLC and Research Scientist at University of Oklahoma, Norman**

ENVIRONMENTAL AND ISOTOPE CHEMISTRY; METHODOLOGIES OF COMPOUND-SPECIFIC ISOTOPE ANALYSIS (CSIA); APPLICATIONS OF CSIA IN THE ASSESSMENT OF CONTAMINATED SITES.

### **Professional highlights**

- Development of innovative CSIA methods for environmental VOCs. These methods established the laboratory of the U. Oklahoma as the first provider of routine CSIA services in early 2000s.
- Applications of CSIA in the studies of contaminant attenuation – including first demonstrations of degradation of MtBE occurring at contaminated field sites (Kolhatkar et al., 2002; Kuder et al., 2005), and studies of biotic and abiotic degradation of chlorinated and brominated compounds such as chlorinated ethenes and 1,2-dibromoethane. These studies became a major factor in acceptance of CSIA by environmental industries in the USA.
- Application of CSIA for VOCs from vapor intrusion sites. This relatively novel field of CSIA applications draws on analytical methods developed in U. Oklahoma specifically for samples of indoor air VOCs.

### **Selected publications**

1. Thouement, H.A.A., Kuder, T., Heimovaara, T., and van Breukelen, B.M. (2019) Do CSIA data from aquifers inform on natural degradation of chlorinated ethenes in aquitards? *Journal of Contaminant Hydrology*; 226:103520.
2. Koster van Groos, P.G., Hatzinger, P.B., Streger, S.H., Vainberg, S., Philp, R.P., and Kuder, T. (2018) Carbon isotope fractionation of 1,2-Dibromoethane by biological and abiotic processes. *Environmental Science & Technology*, 52, 3440-3448.
3. Kuder, T., van Breukelen, B.M., Vanderford, M., and Philp, P. (2013) 3D-CSIA: carbon, chlorine, and hydrogen isotope fractionation in transformation of TCE to ethene by a *Dehalococcoides* culture. *Environmental Science & Technology*, 47, 9668–9677.
4. Kuder, T., and Philp, P. (2013) Demonstration of compound-specific isotope analysis of hydrogen isotope ratios in chlorinated ethenes. *Environmental Science & Technology*, 47, 1461–1467.
5. McHugh, T., Kuder, T., Fiorenza, S., Gorder, K., Dettenmaier, E., Philp, P. (2011) Application of CSIA to distinguish between vapor intrusion and indoor sources of VOCs. *Environmental Science & Technology*, 45, 5952-5958.
6. Kuder, T., Wilson, J.T., Kaiser, P., Kolhatkar, R., Philp, P., and Allen, J. (2005) enrichment of stable carbon and hydrogen isotopes during anaerobic biodegradation of MtBE: microcosm and field evidence. *Environmental Science and Technology*, 39, 213-220.
7. Wilson, J.T., Kolhatkar, R., Kuder, T., Philp, P., and Daugherty, S.J. (2005) Stable isotope analysis of MTBE to evaluate the source of TBA in ground water. *Ground Water Monitoring and Remediation*, 25, 108-116.
8. Kolhatkar, R., Kuder, T., Philp, P., Allen, J., and Wilson, J.T. (2002) Use of compound-specific stable carbon isotope analyses to demonstrate anaerobic biodegradation of MtBE in groundwater at a gasoline release site. *Environmental Science and Technology*, 36, 5139-5146.