

The Chair of Analytical Chemistry and Water Chemistry at the Technical University of Munich (TUM) is committed to excellence in research, teaching and interdisciplinary education. We strive to proactively develop analytical tools for detecting health risks to humans and the environment, to better understand pollutants and pathogens dynamics, and to provide mechanistic insights for decision-makers and practitioners to better solve environmental challenges.

We are looking for a

PhD Student (m/f/d) in Instrumental Analytical Chemistry

Compound-specific isotope analysis (CSIA) achieves highly precise measurements of stable isotopes in organic substances. $^{13}\text{C}/^{12}\text{C}$ measurements at natural isotope abundance can elucidate degradation of groundwater contaminants, prove doping in sports, and demonstrate adulteration in food science.

The underlying instrumentation of gas chromatographic separation followed by online combustion reactors and subsequent mass spectrometric analysis, however, requires (i) low method quantification limits and (ii) complete peak separation. Here, comprehensive gas chromatography (GCxGC) offers a powerful innovation, yet presently lacks sufficiently narrow combustion reactors for fast isotope analysis. To spearhead GCxGC for isotope ratio mass spectrometry (IRMS), the project therefore aims (i) to develop suitable miniature reactors and (ii) to modify hardware and software parts of an existing GC-IRMS system to enable GCxGC-IRMS.

In this project you will (a) develop miniature combustion reactors using methods of synthetic inorganic and organic chemistry; (b) modify all existing hardware and software components of a GC-IRMS system (combustion interface coupled to a MAT 253) to enable GCxGC-IRMS; (c) test and optimize the method for environmental samples; (d) closely collaborate with external partners.

Your Qualifications

Applicants must have completed a Master's degree in analytical chemistry, geo- or environmental sciences (specialization: instrumentation of isotope analysis), mechanical engineering (specialization: analytical instrumentation, gas flow) or a closely related science field. Strong analytical and laboratory skills / craftsmanship, ideally professional training, in the modification of technical- / analytical equipment are required. Training and interest in analytical chemistry, isotope analysis, mass spectrometry and environmental analysis is an asset. An excellent standard of written and spoken English is required and knowledge of Ger-

man is an advantage. In the scope of the project, collaboration with other research requires interpersonal skills, the interest to work in an interdisciplinary environment and to integrate into a team, as well as a high motivation for the project.

We offer

- Working in an innovative, well-equipped and scientifically stimulating international environment.
- Further training opportunities through the chair and the graduate school at TUM.
- Remuneration according to standard public service salary (TV EntgO Bund EG 13, 65%) for three years' duration.
- Technical University of Munich is striving to increase the proportion of women; application from women are therefore expressly welcomed.

Applications

If you are highly motivated, enthusiastic and independent person with passion to conduct research, submit your application to [Prof. Martin Elsner](#) by email until **30 September 2021**. Your application should include a cover letter, a complete CV, along with three references, relevant documents such as certificates, transcript of marks, theses and publications.