

Garching, 31. Oktober 2025

PhD Position on the Analysis of Microplastics and Nanoplastics

The position is open at Raman & SEM Group, Chair of Analytical Chemistry and Water Chemistry, Institute of Water Chemistry (IWC), TUM School of Natural Sciences (Department of Chemistry), Technical University of Munich (TUM). The group is focusing on the development and establishment of Raman-based methods for the analysis of complex samples, with special attention to automation and online/ high-throughput analytics.

Topic: Microplastics and nanoplastics are emerging particulate anthropogenic pollutants. These tiny plastic particles and fibers are found in air, drinking water and food – raising concerns about their impacts on the human health. However, little is known about translocation and accumulation of small microplastics and nanoplastics as well as engineered metal-based nanoparticles in human placenta.

The PhD candidate will be working for the DFG project **“Analysis of Micro- & nanoplastics and engineered Nanoparticles in human Placenta / MiNAPLA”** in collaboration with Ulm University (Institute of Analytical and Bioanalytical Chemistry and Ulm University Hospital). The aim of the project is the **development** and establishment of valid **analytical methodologies to detect, quantify and characterize micro- & nanoplastics** and engineered metal-based nanoparticles in human placenta and blood at low concentration of analytes as expected for real-world samples. Moreover, special attention will be drawn to the co-existence of microplastics and metals to evaluate the occurrence of Trojan-horse phenomenon.

We are inviting applications for a PhD position and offer:

- Supervision, mentoring, and support by PD Dr. Natalia P. Ivleva
- Extensive qualification and education programs, structured training at TUM Graduate School, active participation in European and international conferences
- Working in a dynamic, stimulating, supporting and interdisciplinary environment with the focus on the development of Raman-based methods for the analysis of various analytes
- State-of-the-art laboratory facilities, including Raman Microspectroscopy, (Cryo-)SEM/EDX, Field-Flow Fractionation (FFF) and (sp)-ICP-MS equipment
- 3 years PhD position in Raman & SEM Group, IWC-TUM
- Opportunities scientific collaborations with German and international partners developing and producing analytical instruments for particle characterization

What will make you successful:

- Master degree in (analytical) chemistry, biochemistry or equivalent
- High motivation and ability for independent, systematic and reliable scientific work
- Extended experience in chemical, analytical and spectroscopic laboratories, ability to work in a clean environment and to deal with trace analysis
- Good skills in programming (preferentially Python) and chemometrics, experience in the automation of method(s) and in the evaluation of spectroscopic data
- Excellent written and oral communication in English, as well as social skills; German would be welcome
- Competence in micro- and nanoplastic analysis, sample preparation, physico-chemical characterization of particles would be a strong asset

How to apply:

Please send a single pdf file including a letter of motivation, a CV with University grades, the contact details of two referees, summary of the Master thesis (one page max.), a research vision (one page max.) and, if available, copies of research papers. As part of the Excellence Initiative of the German federal and state governments, TUM has been pursuing the strategic goal of substantially increasing the diversity of its faculty. The TUM is an equal opportunity employer. TUM aims to increase the proportion of women and therefore particularly welcomes applications by women.

Applications should be addressed to natalia.ivleva@tum.de.

Applications will be considered until the position has been filled.