

Helmholtz-Zentrum Dresden-Rossendorf e.V.



With cutting-edge research in the fields of ENERGY, HEALTH and MATTER, around 1,500 employees from more than 70 nations at Helmholtz-Zentrum Dresden-Rossendorf (HZDR) are committed to mastering the great challenges facing society today. The Institute of Resource Ecology (IRE) performs research to protect humans and the environment from hazards caused by pollutants resulting from technical processes that produce energy and raw materials. One major goal is gaining a better understanding of fundamental processes defining transport and accumulation of radiotoxic elements in the geo- and biosphere including the food chain. The Department of Surface Processes invites applications as

PhD Student (f/m/d) to experimentally investigate fundamental geochemistry of technetium (Tc).

Tc is the lightest chemical element with only radioactive isotopes and very interesting chemical and physical properties. Although of high concern, in particular for the safety assessment of potential nuclear waste repositories, technetium molecular interactions in the environment are poorly understood. The PhD studies will focus on the immobilization of Tc triggered by Fe(II)-carbonate minerals. The retention of Tc will be comprehensively quantified by (radio)analytical techniques. By combining a variety of spectroscopic, microscopic and diffraction techniques the underlying molecular processes will be identified and characterized. The PhD studies are part of the RULET joint project “Rückhaltung und Löslichkeit dosisrelevanter Radionuklide unter den reduzierenden Nahfeldbedingungen eines Endlagers im Ton- oder Kristallingestein” (“Retention and solubility of dose-relevant radionuclides under the reducing near-field conditions of a repository in clay or crystalline rock”), that is funded by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection RULET (02E12224E).

City: Dresden; Starting Date: At the earliest possible; Remuneration: TVöD-Bund;
Reference number: 2025/18; Closing date: 09/02/25

Working field

- Synthesis and characterization of Fe(II) carbonate minerals
- Retention experiments of inorganic technetium with Fe(II) carbonate minerals in presence and absence of inorganic complexing ligands
- Characterization of the Tc structural environment at the mineral water interface by spectroscopic and microscopic techniques
- Presentation of scientific results at international conferences and their publication in peer-reviewed journals
- Supervision of master and bachelor students

Requirements

- Completed university studies (Master/Diploma) in Natural Science, preferably in Chemistry, Biochemistry, Geoscience or related field
- Experience in experimental lab work, high motivation and self-initiation
- Willingness to handle open radioactive materials in a radiation safety controlled lab is required
- Experiences in synthesis and characterization of air sensitive minerals are helpful
- Experiences in spectroscopy (Raman, Mössbauer, infrared, X-ray photoelectron spectroscopy, nuclear magnetic resonance) and/or other physico-chemical characterization techniques (X-ray diffraction, electron microscopy) are helpful
- Ability to communicate and conduct work in an interdisciplinary research team (radiochemistry, biochemistry, geochemistry, physical chemistry) and willingness to participate in scientific conferences and workshops
- Excellent fluent communication skills in (scientific) English
- Basic German knowledge is an advantage

What We Offer

- A vibrant research community in an open, diverse and international work environment
- Scientific excellence and extensive professional networking opportunities
- A structured PhD program with a comprehensive range of continuing education and networking opportunities - more information about the PhD program at the HZDR can be found here
- Salary and social benefits in accordance with the collective agreement for the public sector (TVöD-Bund) including 30 days of paid holiday leave, company pension scheme (VBL)
- We support a good work-life balance with the possibility of part-time employment, mobile working and flexible working hours
- Numerous company health management offerings
- Employee discounts with well-known providers via the platform Corporate Benefits
- An employer subsidy for the "Deutschland-Ticket Jobticket"

Application

We look forward to receiving your application documents (including cover letter, CV, diplomas/transcripts, etc.), which you can submit via our online-application-system: <https://www.hzdr.de/db/Cms?pNid=490&pLang=en&pOid=73704>

More information at <https://stellenticket.de/190785/>

Offer visible until 08/02/25

