At the TU Bergakademie Freiberg, Faculty of Mechanical, Process and Energy Engineering, Institute of Ceramics, Refractories and Composite Materials an open position of a

Research Associate (m/f/d) – reference number 224-E/2023

within the DFG Research Training Group GRK 2802 "Refractory Recycling: A contribution for raw material-, energy- and climate-efficiency in high temperature processes", Cohort II, PhD project P1 „Increase of creep resistance of refractory materials based on MgO-C recyclates by means of functional additives"

is available from July 1st, 2024.

Pay grade:	according to German pay grade E13 TV-L
Hours:	1,0 FTE (40 hours/week; part-time possible)
Contract type:	fixed-term for 48 months (until June 30th, 2028)

The focus of the Research Training Group 2802 is an interdisciplinary education of PhD students in order to be able to acquire the abilities to explore the material property spectrum as well as the limitations of a new generation of high temperature materials on the basis of refractory recyclates with specific thermo-mechanical, chemical and functional properties in high temperature processing in the metallurgy, and to develop new ideas accompanied by new scientific fields. Thereby a material oriented CO_2-reduction shall be achieved via refractory material recycling.

The aim of the PhD project 1, Cohort II is to develop a new generation of carbon bonded refractory materials, so-called "Green Refractories" based on MgO-C recyclates, environmentally friendly binders and targeted application of additives. The low CaO content of MgO-C recyclates has a negative impact on the CaO/SiO_2 ratio and hence on the high temperature properties of the Green Refractories derived thereof. By tailored application of CaO and/or ZrO_2 containing additives a high refractoriness under load and creep in compression should be aimed. The new developed „Green Refractories" shall be tested in a RUL device and in a steel casting simulator in terms of creep and thermal shock resistance, respectively. Furthermore, the interactions between the new developed refractory materials and steel melts shall be investigated by means of an Automatic Feature Analysis (AFA) in a SEM.

Job description:

- working on a multidisciplinary scientific topic in the field of recycling of refractory materials
- readiness and ability to complete a PhD thesis
- conceptualization and performing experiments associated with the development of sustainable refractory materials as well as their testing and microstructure characterization
- analysis of experimental data, interpretation of results
- discussion of results within an interdisciplinary research team
- writing of reports
- writing and submitting of scientific publications in peer-reviewed journals
- presentation of research results at national and international conferences

What you can expect from us:

- working at a family-friendly university with flexible working hours
- renumeration according to the provisions of the collective agreement for the public service of the German federal states in accordance with the personal requirements
- attractive fringe benefits, e.g. Asset-based benefits (VL), company pension schemes (VBL), health management, "Job-Ticket"
- a wide range of networking, mentoring and development opportunities
- a focused research programme and a structured training strategy

What we expect from you:

- university diploma or master´s degree in Materials Science, Materials Engineering or related disciplines
- outstanding theoretical knowledge and practical skills in processing and characterisation of refractory materials
- an aptitude for experimental research work
- good team-working and communication skills
- excellent English and German skills, both written and spoken

For selecting the best suited and highly motivated PhD candidates a three-stage weighted procedure will be applied:

Stage I. **Submitted written application documents** (weighting: letter of motivation 10%, final grade 50%, relevance of the master´s or diploma thesis 40%)

Stage II. **Online interview via the conferencing system BigBlueButton** (weighting: motivation 30%, professional skills 50%, language skills 20%)

Stage III. **Oral presentation at the TU Bergakademie Freiberg** (weighting: 10-minute oral presentation on the given topic: 50%, discussion 50%).

For further information please contact Prof. Dr. Christos G. Aneziris (phone: +49-3731 39-2505, e-mail: aneziris@ikfvw.tu-freiberg.de).

The applicant (m/f/d) must meet the hiring requirements for fixed-term employment contracts according to the WissZeitVG. Applicants with disabilities will receive preferential consideration, provided they possess equal qualifications. For consideration, we ask you to submit proof of your disabled status together with your application documents. TU Bergakademie is committed to increasing the number of women in teaching and research positions, hence qualified female candidates are especially encouraged to apply.

Written applications, including a CV, motivation letter and copies of all relevant qualifications documents (certificates, diplomas) as well as and a summary of the thesis, should be submitted by **March 15, 2024** stating **reference number (224-E/2023)** to the following address:

TU Bergakademie Freiberg, Dezernat für Personalangelegenheiten, 09596 Freiberg or e-mail: bewerbungen@tu-freiberg.de

Your application documents will not be returned, please only submit copies. TU Bergakademie Freiberg is always looking for scientific personnel from various disciplines. Further information can be found at http://tu-freiberg.de.