TECHNISCHE UNIVERSITÄT BERGAKADEMIE FREIBERG
Die Ressourcenuniversität. Seit 1765.

FAMILIE IN DER HOCHSCHULE
Mitglied des Best Practice-Clubs

At the 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 114-E/2022

within the DFG Research Training Group "Refractory Recycling: A contribution for raw material-, energy- and climate-efficiency in high temperature processes", PhD project P7 "Metal-ceramic composites based on MgO or MgO-C recyclates and steel and other additives as inert or low-carbon anodes for the fused-salt electrolysis of aluminium"

is available.

Pay grade:	according to German pay grade E13 TV-L
Hours:	1,0 FTE (part-time possible)
Contract type:	fixed-term for 48 months

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 process oriented CO_2-reduction shall be achieved via upcycling of refractory recyclates in order to produce functionalised, metal-ceramic composites for low-carbon metallurgical processes.
The aim of the PhD project P7 is to develop novel metal-ceramic composites based on coarse- and fine-grained MgO or MgO-C recyclates and Cr-Ni steel. By means of an extrusion, sintering and a targeted subsequent oxidation, a new generation of inert, metal-ceramic electrodes will be researched. In order to achieve a high electrical conductivity, the contribution of Ni/NiO/TiO_2 additives as well as the interface design will be investigated by means of REM/FIB/EBSD. Another promising approach to adjust the electrical conductivity is the utilisation of MgO-C recyclates along with the addition of pre-synthesised or in-situ formed MAX phases. Microcrystalline cellulose and protein- and carbohydrate-based additives will be used as binders for the extrusion. A passivation layer based on Al_2O_3/MgO/TiO_2 aiming at oxidation inhibition of the metal-ceramic composite will be applied using flame spraying technique.

Job description:

- working on a multidisciplinary scientific topic in the field of upcycling of refractory recyclates
- planning 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
- a wide range of networking, mentoring and development opportunities
- a focused research programme and a structured training strategy
- attractive fringe benefits, e.g. Asset-based benefits (VL), company pension schemes (VBL), health management, "Job-Ticket"

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 metal-ceramic composite materials
- an aptitude for experimental research work
- good team-working and communication skills
- advanced English and German skills
- readiness and ability to complete a PhD thesis

A three-stage, weighted process is used to select the best suited and highly motivated PhD candidates.
For more information, see:
https://tu-freiberg.de/forschung/grk2802/stellenangebote

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) and a summary of the thesis, should be submitted by **June 7th, 2022** stating **reference number (114-E/2022)** 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/wirtschaft/karriere/stellenausschreibungen