

**Technische Universität Berlin**

Technische Universität Berlin offers an open position:

## Research Assistant - salary grade E13 TV-L Berliner Hochschulen

part-time employment may be possible

### Faculty VI - Institute of Civil Engineering / Building Materials and Construction Chemistry

**Reference number:** VI-615/24 (starting at the earliest possible / limited for 36 months / closing date for applications 29/11/24)

#### Working field:

Binders are the main source of CO<sub>2</sub> emissions in the production of concrete. The aim of achieving climate neutrality in concrete construction means that the composition of binders will change significantly over the next few years, from low-clinker cements with a high content of cement substitutes to completely clinker-free binders such as alkali-activated binders (AAB), which also include geopolymers. In an effort to ensure that these developments can progress rapidly and that the durability of the new binders is also guaranteed, thermodynamic modelling is required in addition to experimental work. To deepen the knowledge in this area, the TU Berlin is conducting the DFG project 'Thermodynamic Data for Production and Utilization of Net-Zero Binders (DatProBind)' together with the Chair of Building Materials Science at RWTH Aachen University.

The basis for meaningful thermodynamic modelling of binders is reliable thermodynamic data of all starting materials and hydration products used. This is where the planned research project comes in. The phases resulting from the new binders are to be synthesised and characterised in detail from a chemical-mineralogical point of view and the relevant thermodynamic data recorded in the process. The phases to be analysed relate specifically to binder systems with a low clinker content and high levels of additives as well as alkali-activated binders. The data obtained will be entered into the Cemdata database and published. In addition, the existing thermodynamic models will be expanded. To this end, interdisciplinary work is to be carried out to plan, implement and evaluate extensive investigations in the field of binder chemistry and thermodynamic modelling.

To achieve the project objectives, pure phases are to be synthesised under inert gas. The synthesised materials and inorganic binders as well as their hydration products are to be characterised using the following methods, among others: FTIR spectroscopy, low-vac scanning electron microscopy (SEM), X-ray diffraction (XRD) with Rietveld analysis, X-ray fluorescence analysis (XRF), mercury pressure porosimetry (MIP), heat flow calorimetry, ICP/OES and DSC/TG. The analysis data is used to determine thermodynamic data, which is entered into the Cemdata 18 database and used for further thermodynamic modelling of new binder systems. The results are to be analysed holistically using statistical methods and published in reports and publications.

There is the possibility of obtaining a doctorate.

#### Requirements:

- successfully completed university degree (Master, Diplom or equivalent) in materials science, chemistry, geosciences, civil engineering or related disciplines with specialisation in building materials/construction chemistry
- in-depth knowledge in the field of building materials and construction chemical additives or thermodynamic modelling is required
- good knowledge of German and/or English required; willingness to acquire the respective missing language skills
- Applicants should indicate their experience in the field of the announced topic and the analytical methods used so far.

#### Desirable:

- experience in the field of the above-mentioned analytical methods is an advantage
- high motivation and ability to work independently; willingness to work in an international and interdisciplinary team
- experience in writing scientific publications

Please send your application with the **reference number** and the usual documents **only by email** (in a PDF file, max. 5 MB) to Prof. Dr. Stephan ([info@baustoffe.tu-berlin.de](mailto:info@baustoffe.tu-berlin.de)).

By submitting your application via email you consent to having your data electronically processed and saved. Please note that we do not provide a guaranty for the protection of your personal data when submitted as unprotected file. Please find our data protection notice acc. DSGVO (General Data Protection Regulation) at the TU staff department homepage: [https://www.abt2-t.tu-berlin.de/menue/themen\\_a\\_z/datenschutzerklaerung](https://www.abt2-t.tu-berlin.de/menue/themen_a_z/datenschutzerklaerung).

To ensure equal opportunities between women and men, applications by women with the required qualifications are explicitly desired. Qualified individuals with disabilities will be favored. The TU Berlin values the diversity of its members and is committed to the goals of equal opportunities. Applications from people of all nationalities and with a migration background are very welcome.

Technische Universität Berlin - Die Präsidentin - Fakultät VI, Institut für Bauingenieurwesen, FG Baustoffe und Bauchemie, Prof. Dr. Stephan, Sekr. TIB1-B4, Gustav-Meyer-Allee 25, 13355 Berlin

The vacancy is also available on the internet at  
<https://www.personalabteilung.tu-berlin.de/menue/jobs/>

