

**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-696/24 (starting at the earliest possible / until 31/12/2027 / closing date for applications 07/02/25)

#### Working field:

Asphalt roads are a key pillar of German infrastructure and therefore of our modern economy and society. However, the climate crisis and the current situation in Europe mean that asphalt as a building material is more at risk than ever before. Not only is the availability of the bituminous binder constantly decreasing and will become scarce in the long term as a result of the energy transition and the associated move away from crude oil. The current situation in the Ukraine war and the ban on oil imports from Russia, previously one of Germany's largest oil suppliers, have also made the asphalt industry painfully aware of its dependence on oil. In order to be able to maintain our road network and thus our infrastructure in the future, the asphalt industry must therefore take paths that are independent of oil in the long, medium and short term. In this context, the TU Berlin wants to develop possible alternative binders for asphalt in a joint research project with the Chair of Road Construction at the Ruhr University Bochum and the Federal Institute for Materials Research and Testing (BAM) in Berlin. These alternative binders should be bio-based and sustainable, with the biopolymer lignin serving as the basis. The aim of the project is to develop lignin-based substitutes that can initially partially replace bitumen in asphalt and (in the long term) possibly even replace it completely. Furthermore, the developed substitution products should also be able to be used for the reuse of reclaimed asphalt in order to optimize reuse in this way. To achieve this goal, differently modified lignin fractions are to be developed from the secondary raw material lignin produced in the pulp and paper industry and then combined to form a binder with specific properties.

The above-mentioned research project is the "Alternative binders for sustainable asphalt road construction (NAspBi)" project funded by the German Federal Highway Research Institute (bast). The TU Berlin sub-project "Modified lignin fraction, chemistry and environmental impact" comprises the chemical characterization of the alternative materials and the binders, including the evaluation of the resulting binders with regard to environmental compatibility and occupational safety, in close cooperation with BAM. Another focus of the work of TU Berlin (together with BAM and subcontractor FUB) is on the development of modified lignin fractions. The aim of this sub-project is to gain an in depth understanding of the modification and functionalization of lignin fractions on the one hand and the structure, composition and ageing processes of the resulting binders based on the developed lignin fractions on the other.

The following investigation methods are used for bitumen and alternative materials as well as mineral fillers and rocks: asphaltene separation, solid phase extraction (SPE), thermogravimetry, (micro) X-ray fluorescence analysis, thermal extraction-desorption gas chromatography with mass spectrometry, elution tests including the determination of total organic carbon. The results of the individual methods are to be evaluated for comparison with the investigation results of the partners and other project participants and published in reports and publications.

#### Requirements:

- successfully completed university degree (Master, Diplom or equivalent) in materials science, chemistry, geosciences, civil engineering or related disciplines with a specialization in construction materials/construction chemistry or asphalt
- in-depth knowledge in the field of construction materials and construction chemical additives or bituminous construction materials is a prerequisite
- good knowledge of German and/or English required; willingness to acquire the respective missing language skills.

When applying, existing experience in the field of the advertised topic and the analysis methods used to date must be stated.

#### Desirable:

- Experience in the field of the abovementioned analytical methods and experience with the reuse of asphalt is advantageous
- high motivation and ability to work independently and scientifically
- 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/>

