Conducting research for a changing society: This is what drives us at Forschungszentrum Jülich. As a member of the Helmholtz Association, we aim to tackle the grand societal challenges of our time and conduct research into the possibilities of a digitized society, a climate-friendly energy system, and a resource-efficient economy. Work together with around 7,500 employees in one of Europe's biggest research centres and help us to shape change!

At the Institute of Energy Materials and Devices – Structure and Function of Materials (IMD-1), we develop and characterize high-performance structural and functional materials, as well as working media, for both centralized and decentralized energy conversion and storage systems.

Our interdisciplinary research aims to advance the understanding of material behavior and underlying processes across a range of energy technologies. One key area of focus is the study of solid oxide cells in both fuel cell and electrolysis modes. In this context, we use a variety of experimental techniques, analytical methods, and modeling approaches.

To support the global transition to green hydrogen, enhancing the reliability of solid oxide electrolyzers is a crucial step. This requires a deep understanding of the correlations between mechanical properties and microstructure under application-relevant conditions.

We are offering an interesting

PhD Position – Mechanical properties and microstructure of advanced ceramic materials for solid oxide electrolyzers

Your Job:
As part of a collaborative research project funded by the Federal Ministry of Research, Technology and Space (BMFTR), and conducted in cooperation with academic and industrial partners, your work will contribute to establishing a fundamental understanding of the mechanical properties and microstructure of newly developed advanced ceramic materials for solid oxide electrolyzer cells. The aim is to evaluate and improve the long-term reliability of these materials for green hydrogen production.

We look forward to receiving your application until 31.08.2025 via our **Online-Recruitment-System!**
Questions about the vacancy?
Get in touch with us by using **our contact form.**
Please note that for technical reasons we cannot accept applications via email.
www.fz-juelich.de

To achieve this, your responsibilities will include:

- Design and execution of experiments to investigate mechanical properties under application-relevant conditions
- Microstructural characterization using advanced optical and electron microscopy techniques
- Analysis and correlation of mechanical behavior with microstructural features and failure mechanisms
- Development of models to describe degradation mechanisms and predict component lifetime
- Presentation of research findings at project meetings, workshops, and international conferences
- Publication of results in peer-reviewed scientific journals

Your Profile:

- Excellent university degree (Master's or Diploma) in materials science, metallurgy, physics, mechanical engineering, chemistry, or a related field
- Strong interest in application-oriented fundamental research
- High level of independence, initiative, and creativity in developing experimental approaches and solving scientific problems
- Strong communication skills and a high degree of teamwork, with the ability to work effectively in an interdisciplinary research environment
- Knowledge of ceramic materials, mechanical testing methods, and microstructural characterization techniques
- Very good command of English (spoken and written); basic knowledge of German is desirable

Our Offer:

We work on the very latest issues that impact our society and are offering you the chance to actively help in shaping the change! We offer ideal conditions for you to complete your doctoral degree:

- A highly motivated team and an international, interdisciplinary working environment at one of Europe's leading research institutions
- Access to outstanding scientific and technical infrastructure
- Opportunities to participate in international conferences and project meetings
- Continuous academic support and mentoring by your scientific advisor
- Flexible working arrangements, including the possibility of remote work (partly)
- An exciting research position in a dynamic and collaborative environment
- Extensive opportunities for personal development and training, e.g. through an extensive range of training courses; a structured program of continuing education and networking opportunities specifically for doctoral researchers via the graduate school HITEC: https://www.hitec-graduate-school.de/
- 30 days of annual leave
- Targeted services for international employees, e.g. through our International Advisory Service

The position is limited to a duration of three years. Remuneration will be in accordance with 75 % of pay group 13 of the Collective Agreement for the Public Service (TvöD-Bund) and additionally 60 % of a monthly salary as special payment („Christmas bonus").

The doctoral degree associated with this position will be awarded by RWTH Aachen University, subject to the university's admission and graduation requirements.

Further information on doctoral degrees at Forschungszentrum Jülich is available at: www.fz-juelich.de/gp/Careers_Docs

We welcome applications from people with diverse backgrounds, e.g. in terms of age, gender, disability, sexual orientation / identity, and social, ethnic and religious origin. A diverse and inclusive working environment with equal opportunities in which everyone can realize their potential is important to us.

Further information on diversity and equal opportunities: https://go.fzj.de/equality