

Job Title: PhD student / Doctoral fellow on slag conductivity

Department of Materials, Textiles and Chemical Engineering

Occupancy: 100%

Limited duration: 4 years

Diploma: Materials Science Engineer or equivalent

Job Description

- About 90% of your assignment will be spent on academic research in preparation of a PhD. Academic research activities include performing research on the subject outlined below, counselling master students active within your research project, project management and reporting, dissemination in high quality journals and conferences, and identifying opportunities for follow-up research work. In addition to academic research, you will be involved in educational tasks related to the subject of your research.
- The initial contract duration will be one year. The contract will be extended to a full 4-year PhD research period under the condition of a positive evaluation after the initial period. Ghent University offers an attractive salary with additional benefits, a positive and inspiring working environment and training possibilities.
- Your research will be counselled in the Sustainable Materials Science research group at Ghent University (<https://www.ugent.be/ea/match/sms/en>) and work within a young and dynamic research team. The research is situated within a project with active cooperation with international partners.

This vacancy aims to select a PhD researcher having a materials (metals) engineering background. This researcher will work on the investigation of slag conductivity. In both an Electric Arc Furnace (EAF) and Electric Submerged Furnace (ESF), the slag conductivity is an essential property. Both types of furnaces will be essential to answer to the future steel demand: EAFs will be used for increased scrap usage and high-grade-ore-based DRI (produced via H₂ reduction) and ESFs will be used to melt the H₂ direct reduced low- and medium-grade ores. For the EAF, electrical conductivity influences the arc efficiency and the electrode consumption. For the ESF, it influences the Joule heating effect, essential in this kind of furnaces. Unfortunately, slag conductivity is under-reported in literature and measuring it requires a very specific set-up. The latter is available in the laboratories of our research group and allows very accurate measurements of slag conductivities for a wide range of compositions. Both compositional and temperature influences can be measured with the set-up for the specific range of compositions relevant for the process under investigation. In this PhD, main focus will be on experimental work, which you will complement with modeling efforts when needed. As such you will contribute to the development of the steel production routes of the future.

Job Profile

- You hold an MSc degree in Materials (Metal) Engineering, with an affinity for and keen interest in pyrometallurgical research .
- Experience with relevant and complementary experimental techniques, such as material characterization techniques, is a clear asset.
- Knowledge and understanding on the slag properties and the steel production process is an advantage.

- You have a strong motivation for conducting scientific research and dealing with complex research questions within a high level research team.
- You possess structured and creative problem-solving abilities, strong analytical and technical skills, critical scientific mindset and take responsibility for the development of your work.
- You can work independently as well as in team.
- You have excellent English communication skills (written and oral).
- Knowledge of Dutch is a plus, not a must.

How to apply?

All applications must be received no later than April 1st, 2024 at vacancy.sms@ugent.be with the following documents attached as a single pdf file:

- application letter
- curriculum vitae
- a transcript of the required degree
- names and contact details of at least three reference persons

The subject line of your email should contain: PhD on slag conductivity

Attention: Late applications are not accepted. As Ghent University maintains an equal opportunities and diversity policy, everyone is encouraged to apply for this position. For more information about this vacancy please contact Prof. Kim Verbeken (kim.verbeken@ugent.be) or Prof. Inge Bellemans (Inge.Bellemans@ugent.be)

We offer a PhD scholarship for one year, which will be extended with another three years after positive evaluation, according to the general conditions at Ghent University. The appointment will start on September 1st, 2024 at the earliest.

The scholarship includes full social security coverage and a number of benefits such as a wide range of training and education opportunities, bicycle commuting reimbursement, etc. More information can be found on the Ghent University website (<https://www.ugent.be/en/work/talent>). We will provide high-quality training to develop hard and soft skills as well as opportunities to participate in international scientific workshops/conferences.