

Jobbnoze ID: 258759
Deadline: 4/15/2024
Website: <http://www.ntnu.no>
Scope: Fulltime
Duration: Fixed Term

The Department of Materials Science and Engineering has a vacancy for a

PhD research fellow in Zero Emission Silicon and Manganese production through electrowinning, ZeSiM

This is NTNU

NTNU is a broad-based university with a technical-scientific profile and a focus in professional education. The university is located in three cities with headquarters in Trondheim.

At NTNU, 9,000 employees and 43,000 students work to create knowledge for a better world.

You will find more information about working at NTNU and the application process [here](#).

Video: <https://youtu.be/Xt-yHCN5QS0>

About the job

A PhD research fellow position for a new zero emission silicon production process is available. The PhD candidate will be part of a team at the Department of Materials Science and Engineering at NTNU, Trondheim, and work on the ZeSiM research project where NTNU, the research organisation SINTEF, and [The Norwegian Ferroalloy Producers Research Association \(Norwegian abbreviation: FFF\)](#) are partners. The ZeSiM project is financed by The Research Council of Norway and FFF.

Today the FFF member companies produce silicon/ferrosilicon and ferromanganese by Submerged Arc Furnace processes with corresponding CO₂ emissions and electrical energy consumption. The ZeSiM project is a part of FFF's plans for future zero emission processes for silicon and manganese/ferromanganese production. It is based on electrowinning of metals, i.e. electrochemical deposition of silicon from a molten salt electrolyte and electrochemical deposition of manganese/ferromanganese from a molten oxide electrolyte. The primary objective of the ZeSiM project is to prove the feasibility of new CO₂ free electrolysis processes for manganese/ferromanganese and silicon that could eventually could be an alternative process to or substitute the SAF processes. For more information on the project: [ZeSiM](#)

In the ZeSiM project one PhD research fellow and one PostDoc will be employed. The PhD research fellow will work on the silicon process and the PostDoc will work on the manganese process, both at DMSE. Although different processes, the two will work closely together and in collaboration with their supervisors and other experts from the partners.

Duties of the position

The PhD candidate for this particular position will by using several electrochemical methods study the deposition of silicon in molten salt mixtures of chlorides and fluorides. Using refined quartz as raw material, the effects of electrolyte composition, operating temperature, current density, and electrode material on the Si electrodeposition kinetics, current efficiency, as well as the Si deposit's morphology, purity, and adherence to the substrate, will be studied. Also, the the kinetics and electrode process of an oxygen evolving anode will be studied.

The PhD candidate will plan and conduct experiments and analyse results according to the project objectives with support from the supervisors and the larger project team. Information about the Electrochemistry group at DMSE can be found [here](#). The results of the project are expected to be published in scientific journals and at national/international conferences as well as presented to research partners in the ZeSiM project. The project aims for a completed doctoral education up to an obtained doctoral degree.

Required selection criteria

- You must have a professionally relevant background in materials science and engineering or inorganic chemistry, physics, or chemical engineering, with emphasis on thermodynamics, and materials chemistry
- Your education must correspond to a five-year Norwegian degree program, where 120 credits are obtained at master's level
- You must have a strong academic background from your previous studies and an average grade from the master's degree program, or equivalent education, which is equal to B or better compared with NTNU's grading scale. If you do not have letter grades from previous studies, you must have an equally good academic basis. If you have a weaker grade background, you may be assessed if you can document that you are particularly suitable for a PhD education.

- Master students who expect to complete their studies by summer 2024 are encouraged to apply. Employment might then be postponed until the Master's degree is finished.
- You must meet the requirements for admission to [the faculty's doctoral program](https://www.ntnu.edu/nv/phd) <https://www.ntnu.edu/nv/phd>
- Good familiarity with electrochemistry and materials characterisation techniques, e.g. electron microscopy and XRD
- Ability to communicate fluently in English and have good communication skills

The appointment is to be made in accordance with [Regulations on terms of employment for positions such as postdoctoral fellow, PhD candidate, research assistant and specialist candidate](#) and [Regulations concerning the degrees of Philosophiae Doctor \(PhD\) and Philosodphiae Doctor \(PhD\) in artistic research national guidelines for appointment as PhD, post doctor and research assistant](#)

Preferred selection criteria

A strong background in electrochemistry, both theoretical and experimental, a strong background in high temperature electrochemical experiments, good writing skills, and good skills in a Scandinavian language are considered as a plus.

Personal characteristics

In the evaluation emphasis will also be on education, experience, and personal suitability. The candidate should:

- take responsibility for own progress and work independently
- be able to collaborate closely with other members of the research team
- be diligent and able to show initiative on behalf of own work
- be structured, targeted and solution-oriented
- have a positive and friendly attitude and contribute to a good social environment
- be creative and innovative

Emphasis will be placed on personal and interpersonal qualities.

We offer

- exciting and stimulating tasks in a strong international academic environment
- collaboration with industry through FFF and SINTEF
- an open and [inclusive work environment](#) with dedicated colleagues
- favourable terms in the [Norwegian Public Service Pension Fund](#)
- [employee benefits](#)

Salary and conditions

As a PhD candidate (code 1017) you are normally paid from gross NOK 532 200 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is 3 years. The period might be extended to 4 years if teaching duties are assigned.

The starting date is August 12 2024 or if not an individual agreement is made.

Appointment to a PhD position requires that you are admitted to the [PhD programme in Materials Science and Engineering](#) within three months of employment, and that you participate in an organized PhD programme during the employment period.

The engagement is to be made in accordance with the regulations in force concerning [State Employees and Civil Servants](#), and the acts relating to Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU. After the appointment you must assume that there may be changes in the area of work.

It is a prerequisite you can be present at and accessible to the institution daily.

About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must be attached to the application. Please note that your application will be considered based solely on information submitted by the application deadline. You must therefore ensure that your application clearly demonstrates how your skills and experience fulfil the criteria specified above.

The application must include:

- A cover letter describing the personal motivation, summarising scientific work, and how the applicant evaluates the background suitable
- A draft research proposal (1 or 2 pages) for the PhD study, presenting ideas for the PhD-work and how the ideas can be applied, based on the information about the position given in this advertisement. This proposal will be neither final nor binding for the project.
- CV, certificates and diplomas
- Transcripts and diplomas for bachelor's and master's degrees. Master students who expect to complete their studies by summer 2024 are encouraged to apply. Employment will then be postponed until the Master's degree is finished.
- Name, address and contact information of three referees
- Documentation of English language proficiency.
- Publications or other relevant research work (if already obtained)

If all, or parts, of your education has been taken abroad, we also ask you to attach documentation of the scope and quality of your entire education, both bachelor's and master's education, in addition to other higher education. Description of the documentation required can be found [here](#). If you already have a statement from NOKUT, please attach this as well.

We will take joint work into account. If it is difficult to identify your efforts in the joint work, you must enclose a short description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal and interpersonal qualities. Motivation, ambitions, and potential will also count in the assessment of the candidates.

NTNU is committed to following evaluation criteria for research quality according to [The San Francisco Declaration on Research Assessment - DORA](#).

General information

[Working at NTNU](#)

NTNU believes that inclusion and diversity is our strength. We want to recruit people with different competencies, educational backgrounds, life experiences and perspectives to contribute to solving our social responsibilities within education and research. We will facilitate for our employees' needs.

The city of Trondheim is a modern European city with a rich cultural scene. Trondheim is the innovation capital of Norway with a population of 200,000. The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world. Professional subsidized day-care for children is easily available. Furthermore, Trondheim offers great opportunities for education (including international schools) and possibilities to enjoy nature, culture and family life and has low crime rates and clean air quality.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

A public list of applicants with name, age, job title and municipality of residence is prepared after the application deadline. If you want to reserve yourself from entry on the public applicant list, this must be justified. Assessment will be made in accordance with [current legislation](#). You will be notified if the reservation is not accepted.

If you have any questions about the position, please contact Associate Professor Espen Sandnes, email: espen.sandnes@ntnu.no. If you have any questions about the recruitment process, please contact Marie Kristiansen, e-mail: marie.kristiansen@ntnu.no.

If you think this looks interesting and in line with your qualifications, please submit your application electronically via jobbno.no with your CV, diplomas and certificates attached. Applications submitted elsewhere will not be considered. Upon request, you must be able to obtain certified copies of your documentation.

Application deadline: 15.04.2024.

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

Department of Materials Science and Engineering

We are Norway's leading educational and research environment in materials engineering, materials chemistry and materials science. In collaboration with business and industry, we are a driving force for the development of innovative materials as well as new applications and manufacturing processes. Activities in our disciplines are vital for the green shift. [The Department of Materials Science and Engineering](#) is one of eight departments in the [Faculty of Natural Sciences](#).

Additional information

Place of service:

Trondheim, Gløshaugen 7491 Trondheim (Trondheim Municipality)