Postdoctoral Researcher in Promoter Synthesis for CO_2 Capture (Gas Hydrate Technologies)

Aarhus University invites applications for a fixed-term Postdoctoral Researcher position in synthetic chemistry within the field of Carbon Capture, Utilization, and Storage (CCUS). The position is jointly hosted by the Department of Chemistry and the Department of Biological and Chemical Engineering, and will be embedded within the Partoon and Daasbjerg Groups at the Novo Nordisk Foundation CO_2 Research Center (CORC).

The successful candidate will contribute to the HyperCap research program by developing improved and cost-efficient synthesis routes for thermodynamic promoter systems used in gas hydrate–based carbon capture. The work will include reaction optimization, purification strategy development, scale-up toward bulk production, and exploration of alternative promoter candidates. The postdoctoral researcher will collaborate closely with an engineering team responsible for process integration and prototype development

Expected start date and duration of employment

This is a 2.5–year position starting July 2026, or as soon as possible.

Job description

The successful candidate will join the Partoon Group at CORC – Gas Hydrate Research Group and contribute to the HyperCap 2.1 project. The position focuses on optimizing the synthesis and scalable production of a thermodynamic promoter for gas hydrate–based CO_2 capture.

Primary responsibilities

- Conduct independent and collaborative research on the synthesis and optimization of a proprietary thermodynamic promoter for gas hydrate–based CO_2 capture.
- Improve synthesis routes to significantly increase yield, robustness, and reproducibility while reducing material and processing costs.
- Contribute to the design, construction, and commissioning of a prototype setup for bulk production of selected promoter systems.
- Perform physicochemical characterization and evaluate thermodynamic promotion performance in hydrate formation experiments.
- Produce sufficient quantities of optimized promoter systems to support pilot-scale testing within Hyper-Cap 2.0.
- Identify and assess cost-effective alternative promoter candidates with comparable or improved performance.
- Collaborate closely with researchers engaged in pilot-scale testing to integrate performance feedback into synthesis optimization and scale-up strategies.
- Disseminate results through peer-reviewed publications, conference presentations, and technical reporting.
- Contribute to the preparation of national and international research proposals.

Additional expectations

- Active participation in research coordination within the Hyper-Cap program and cross-project collaboration.
- Contribution to supervision and mentoring of students working on synthesis, hydrate systems, and carbon capture technologies.
- Engagement with industrial and strategic partners where relevant, in line with Tech Faculty criteria for industrial collaboration and impact.
- Commitment to safe laboratory practices and structured documentation of synthesis and scale-up procedures.

Application Deadline:
07 April 2026

Institute/Faculty:
Department of Chemistry

Faculty:
Faculty of Natural Sciences

Academic contact person:
Kim Daasbjerg
Professor
kdaa@chem.au.dk
+4523485249

Vacant positions:
1

Number of months:
30

Hours per week:
37

Expected date of accession:
01/07/2026

Your Profile

Applicants must hold a PhD degree in Chemistry, Chemical Engineering, or a closely related discipline.

We seek a highly motivated and independent researcher with a strong background in organic synthesis and reaction engineering, and a demonstrated track record of high-quality research in synthesis-related technologies.

Research and Technical Qualifications

- Demonstrated expertise in organic chemistry, including reaction mechanisms, synthetic route development, and optimization strategies.
- Strong hands-on experience with experimental laboratory research and process development.
- Proven competence in analytical and characterization techniques such as NMR, Raman spectroscopy, GC, and other relevant compositional and structural analysis methods.
- A strong publication record in peer-reviewed journals and demonstrated ability to conduct and lead independent research activities.

Additional Merits

- Experience in research proposal development and participation in externally funded research projects.
- Strong written and oral communication skills, with the ability to contribute to a collaborative and interdisciplinary research environment.
- Prior experience with CO_2 capture and sequestration technologies, solvent absorption systems, cryogenic separation, solid sorbents, carbon mineralization pathways, or related separation processes.

Who we are

Aarhus University (AU) is a leading international research university consistently ranked among the top 100–150 universities worldwide and among the top institutions in Europe. With a strong emphasis on research quality, interdisciplinary collaboration, and international engagement, AU provides a dynamic and globally oriented academic environment.

This position is jointly hosted by the Department of Chemistry and the Department of Biological and Chemical Engineering (BCE) at Aarhus University and is embedded within the Novo Nordisk Foundation CO_2 Research Center (CORC), whose international research hub is based at AU.

CORC is a mission-oriented international research center dedicated to developing novel science and scalable technologies for CO_2 capture and conversion, with the ambition to be recognized among the leading global centers addressing CO_2-based climate change mitigation. The center integrates chemical sciences, life sciences, and engineering, supported by advanced systems-level modelling and close collaboration with industrial and policy stakeholders.

The successful candidate will contribute to the HyperCap research program focused on developing scalable gas hydrate–based carbon capture technologies. HyperCap combines synthetic chemistry, thermodynamics, and process engineering to advance carbon capture solutions toward pilot-scale demonstration.

The chemical development activities are led by Professor Kim Daasbjerg, who will oversee the chemistry and synthesis components, while Associate Professor Behzad Partoon is responsible for overall program coordination and technology integration. This structure ensures strong disciplinary leadership in chemistry alongside close integration with engineering and scale-up activities.

What we offer

Aarhus University and the Novo Nordisk Foundation CO_2 Research Center offer:

- Access to well-established laboratory infrastructure including facilities for advanced synthesis, high-pressure experimentation, and physicochemical characterization relevant to carbon capture technologies.

- A mission-driven, interdisciplinary research environment embedded within CORC, combining chemical sciences, engineering, and systems modelling to develop scalable CO_2 mitigation technologies.
- Close collaboration with leading national and international partners, including industrial stakeholders engaged in CCUS, energy systems, and sustainable process development.
- Opportunities to contribute to an ambitious research program (HyperCap) advancing novel carbon capture technologies toward pilot-scale demonstration.
- A supportive and collaborative academic culture characterized by open scientific dialogue, strong collegial interaction, and opportunities for professional development.
- A workplace committed to equality, inclusion, and a healthy work–life balance in an internationally oriented university setting.

Place of work and area of employment

The place of work is Gustav Wieds Vej 10C, 8000 Aarhus, and the area of employment is Aarhus University with related departments.

Contact information

For further information, please contact Prof Kim Daasbjerg at +45 23 48 52 49 or kdaa@chem.au.dk or alternatively Associate Professor Behzad Partoon at +45 22 52 16 59 or Behzad.partoon@bce.au.dk.

Application procedure

Shortlisting is used. This means that after the deadline for applications – and with the assistance from the assessment committee chairman, and the appointment committee if necessary, – the head of department selects the candidates to be evaluated. All applicants will be notified whether or not their applications have been sent to an expert assessment committee for evaluation. The selected applicants will be informed about the composition of the committee, and each applicant is given the opportunity to comment on the part of the assessment that concerns him/her self.

Letter of reference

If you want a referee to upload a letter of reference on your behalf, please state the referee's contact information when you submit your application. We strongly recommend that you make an agreement with the person in question before you enter the referee's contact information, and that you ensure that the referee has enough time to write the letter of reference before the application deadline. Unfortunately, it is not possible to ensure that letters of reference received after the application deadline will be taken into consideration.

If you wish to add a referee **after** you have submitted your application, you must send this person's details (name, job title, place of work, and email address) as well as the name of the position you have applied for to: HR.Nattech@au.dk

Formalities and salary range

Natural Sciences refers to the Ministerial Order on the Appointment of Academic Staff at Danish Universities under the Danish Ministry of Science, Technology and Innovation.

The application must be in English and include a curriculum vitae, degree certificate, a complete list of publications, a statement of future research plans and information about research activities, teaching portfolio and verified information on previous teaching experience (if any). Guidelines for applicants can be found here.

Appointment shall be in accordance with the collective labour agreement between the Danish Ministry of Taxation and the Danish Confederation of Professional Associations. Further information on qualification requirements and job content may be found in the Memorandum on Job Structure for Academic Staff at Danish Universities.

Salary depends on seniority as agreed between the Danish Ministry of Taxation and the Confederation of Professional Associations.

Aarhus University's ambition is to be an attractive and inspiring workplace for all and to foster a culture in which each individual has opportunities to thrive, achieve and develop. We view equality and diversity as assets, and we welcome all applicants.

Research activities will be evaluated in relation to actual research time. Thus, we encourage applicants to specify periods of leave without research activities, in order to be able to subtract these periods from the span of the scientific career during the evaluation of scientific productivity.

Aarhus University offers a broad variety of services for international researchers and accompanying families, including relocation service and career counselling to expat partners. Read more here. Please find more information about entering and working in Denmark here.

Aarhus University also offers a Junior Researcher Development Programme targeted at career development for postdocs at AU. You can read more about it here.

At the Faculty of Natural Science at Aarhus University, we strive to support our scientific staff in their career development. We focus on competency development and career clarification and want to make your opportunities transparent. On our website, you can find information on all types of scientific positions, as well as the entry criteria we use when assessing candidates. You can also read more about how we can assist you in your career planning and development.

The application must be submitted via Aarhus University's recruitment system, which can be accessed under the job advertisement on Aarhus University's website.

Aarhus University

Aarhus University is an academically diverse and research-intensive university with a strong commitment to high-quality research and education and the development of society nationally and globally. The university offers an inspiring research and teaching environment to its 37,000 students (FTEs) and 8.700 employees and has an annual revenue of EUR 1.106 billion. Learn more at www.international.au.dk/