

Position: PhD Researcher

Using upstream anaerobic digestion process-control to achieve minimal content of undesired trace elements

Introduction

Ghent University (Belgium) is internationally one of the leading institutes in resource recovery and renewable resources. It is home to the BioRefine Cluster Europe (www.biorefine.eu), a network of international research and development projects with the dedicated focus of guiding innovation towards applied market implementation.

As part of the Ferticycle program, a Marie Skłodowska Curie -European Training Network, we are recruiting a junior expert for a PhD degree at Ghent University (Belgium). The goals of the European Training Network 'New bio-based fertilisers from organic waste upcycling (FertiCycle)' will be achieved by a unique combination of "hands-on" research training, non-academic placements, and workshops on research-related and transferable skills.

Research content

The candidate will focus on integrating bio-based fertiliser production into bio-refinery business concepts. Semi-continuous pilot assessment trials will be performed to achieve optimal biogas yield combined with optimal end-product fertiliser value and quality, taking into account trace metal quality criteria and the optimal NPK nutrient ratio based on crop requirements. For that, the necessary mechanistic algorithms of individual unit process steps will be developed to simulate and predict an ideal feedstock composition to obtain an optimal mineral nutrient composition of end-products (NPK, Ca, Mg, trace elements).

The chosen candidate will pay special attention to the behaviour and fate of undesired components (contaminants) in the digestate. Particular technical challenge will be to minimise undesired trace elements (heavy metals) by adjusting feedstock and process parameters (e.g. precipitation/separation) using process engineering and producing criteria to control effects of variable mineral availability in different soil types. Potential contaminant build-up and behaviour (transformation, speciation) through anaerobic digestion process will be studied, as well as nutrient transformation modelling and bio-assay ecotox-assessment will be applied to predict product characteristics.

Your profile

- You are interested in and motivated by the research topic, as well as in obtaining a PhD degree

- You have mastered the English language, both in writing skills and oral presentations
- Good knowledge of anaerobic digestion/precipitation/separation process
- Experience on chemical analysis with a focus on trace elements (heavy metals)
- Knowledge on analysing the effects of variable mineral availability in the plant and soil
- Knowledge of mechanistic modelling will be an advantage.
- Strong communication and interpersonal skills.
- Experience with cross-disciplinary and/or multi-cultural collaboration
- You have a relevant degree – Master level in applied biological sciences (agriculture, environmental technology, biotechnology...)

Job tasks

Your key tasks as an Early Stage Researcher (ESR) member of the FertiCycle Network and as a PhD student are to:

- Perform independent scientific research, as well as collaborate with other members of the international FertiCycle research network.
- Participate in international secondments (internship as visiting researcher) to other organisations in the FertiCycle network.
- Attend the FertiCycle training programme as well as other PhD courses.
- Deliver written reports of your research on a regular basis.
- Write and publish scientific articles related to your research project and write your PhD thesis.
- Support the valorisation of research results into tangible deliverables.

We offer

- Full-time employment for a period of 3 years – with the possibility of a 1-year extension
- The position is available from 1 June 2020, latest start on 1 September
- Being embedded in a team of young, dynamic experts on nitrogen and phosphorus recovery from academia and industry
- Close supervision and guidance in the conducting of the planned research
- Stimulation to self-improvement by encouraging participation in outreach activities aimed to promote your own scientific research such as summer schools, workshops, and conferences

How to apply

Sending an email to ana.roblesaguilar@ugent.be before April, 12th, 23:59h (Central European Time) (put „Ferticycle“ in the email title) providing the following documents:

- Professional résumé (CV) named as: CV_”family name”
- motivation letter named as: MotivationLetter_”Family name”
- Diploma and transcripts of records (BSc and MSc) named as: Transcripts_”family name”
- Full contact details (Name, address, telephone & email) of at least 1 professional referee