Thesis / internship project

Calcium phosphate biocrystallization during anaerobic digestion

Background:

Phosphorus (P) is essential for life on earth due to its various vital functions in growth and energy mechanisms of fauna and flora. Phosphate rock, the natural resource of P, is finite and dwindling in quality and quantity. A shortage in P would threaten the food security (Cordell et al. 2009).

In the Netherlands, 71 million kg of P are produced as animal manure annually. Here at Wetsus, we research a multidisciplinary approach to trigger calcium phosphate bio granulation during the treatment of animal manure in an up-flow anaerobic sludge blanket (UASB) reactor. The optimization of this process demands for approaches coming from the fields of engineering, chemistry, biology and physics.

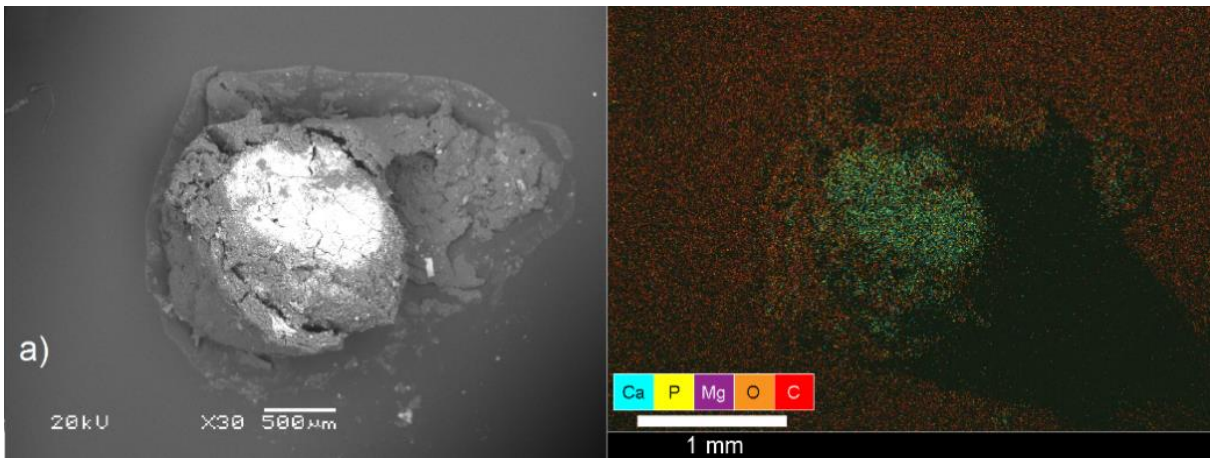

Figure 1, Scanning electron microscope (SEM,left) and electron dispersive x-ray (EDX, right) images of a calcium phosphate granule with an inorganic core consisting of calcium phosphate (EDX green) (Cunha et al. 2018).

Your tasks:

- Designing and implementing a biological hydrolysis reactor prior to the UASB reactor
- Performing and preparing a broad variety of lab analyses
- Evaluating and optimizing reactor and complete process performance

Your benefits:

- Experiencing a multidisciplinary and international working environment
- Developing excellent practical lab skills
- Being part of active research to develop a sustainable biotechnology
- Allowance of 175 euros per month

Your application:

We are looking forward to work with you preferably from **February 2020** for **at least 5 months** at Wetsus in Leeuwarden, if you are an enthusiastic BSc or MSc student in topic related studies. Fluent English, good lab skills and analytical thinking are appreciated. You cannot be afraid of working with animal manure. This offer is eligible for EU citizens only; non-EU citizens need to be enrolled at a Dutch University.

Contact Chris.Schott@wetsus.nl for questions or send a brief motivation letter and your CV to apply.

Cordell, D., Drangert, J.-O. and White, S. (2009) The story of phosphorus: Global food security and food for thought. Global Environmental Change 19(2), 292-305.
Cunha, J.R., Schott, C., van der Weijden, R.D., Leal, L.a.H., Zeeman, G. and Buisman, C. (2018) Calcium addition to increase the production of phosphate granules in anaerobic treatment of black water. Water Research 130, 333-342.