

Phosphorus is a vital nutrient for plants and living organisms. Nowadays, the main source of phosphorus is phosphate rock. Its reserves are limited and are expected to deplete within the next century. At the same time, wastewater contains a large amount of phosphorus that is harmful for the environment if water is discharged without the proper treatment.

During the treatment, phosphorus is transferred from the wastewater into sludge. Sludge is thereafter digested to produce biogas and a digester supernatant (liquid phase). Digester supernatant has the highest concentration of phosphorus in comparison to other liquid streams at the treatment plants. Therefore, phosphorus can be extracted from it by crystallization of sparingly soluble phosphorus compounds (f.x. calcium phosphates).

Production of high quality calcium phosphates allows its use as a feed additive or as a raw material in industry. However, it is a challenging task to recover it due to the presence of various impurities. The development of a process that leads to the improvement of the product quality was addressed in this work. A novel process has been designed consisting of two steps: oxidation and then crystallization. During the first step, organic compounds present in the digester supernatant are partially degraded with the addition of a strong oxidant. This facilitates the formation of calcium phosphates with the improved purity during the second step.