

P027 Application of anammox bacteria

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There is a great demand for new and sustainable systems for nitrogen removal. Conventional systems do not meet the increasing nitrogen loads in a cost effective way. As an alternative, the implementation of the anammox (*anaerobic ammonium oxidation*) process in the treatment of wastewater with high ammonium concentrations has been started. The compact anammox reactors can sustain high nitrogen loads up to 8.9 kg N removed per m³ reactor per day. However, due to the low growth rate, start-up and seed material are important issues for anammox implementation. Survey of different wastewater treatment plants using anammox specific 16S rRNA gene primers and anammox specific oligonucleotide probes has revealed the presence of at least three groups of anammox bacteria. Enrichment cultures of each group have been started to determine the niche differentiation in the present STW project. Furthermore anammox bacteria have to compete with other N-cycle bacteria (aerobic ammonia- and nitrite-oxidizers and anaerobic nitrate-reducing bacteria) in the complex microbial communities for limited resources. Studies on the competitive abilities of the 3 anammox groups have been initiated using molecular and ¹⁵N isotope methods developed in the EU Icon project.