

Monitoring of Anammox processes

The use of partial nitritation and Anammox process for nitrogen removal in different waste streams is an interesting alternative to the more energy and resource intensive nitrification and denitrification processes traditionally used at WWTPs. However, due to the slow growing and sensitive microorganisms involved in the process, off-line determination of the anammox bacteria's metabolic activity has become more and more

important in order to ensure a stable and efficient process. This parameter can be determined with specific Anammox activity (SAA) assays, which are ideal to perform with the highly automated batch fermentation test system Gas Endeavour as its fully automatic operation and high measurement resolution guarantees high quality results with a minimal effort.

Example 1

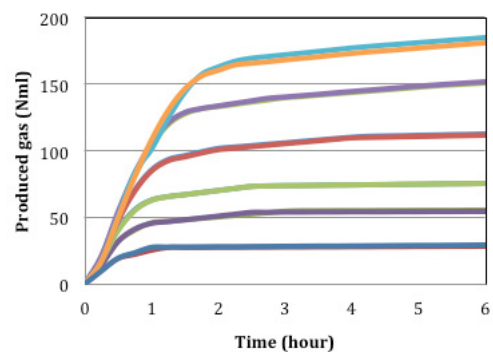
Monitor the performance of a continuous anammox process

By performing SSA assays on a regular time basis it is possible to monitor the enrichment and metabolic activity of the sensitive Anammox bacteria. The information given by the tests will be an important foundation to adjust the operation condition of the process in order to maximise the growth of Anammox bacteria and adjust the feeding strategy, particularly during the process start-up phase. The simple and automatic operation of the Gas Endeavour makes it a perfect tool to perform the necessary SAA tests by saving valuable time and minimising workload.

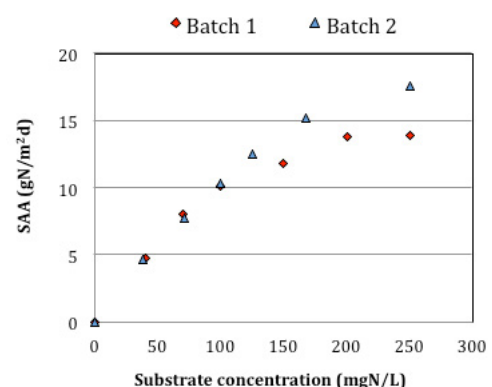
Example 2

Determine the optimal conditions for SAA assays

In order to get reliable results from an SSA assay it is important to standardise several key parameters (e.g. initial substrate-to-biomass ratio, initial biomass concentration, pH, temperature, etc.) of the test. As the Gas Endeavour directly and automatically monitors the nitrogen production, the workload is considerably reduced since sampling for analysis by conventional spectrophotometric and chemical analysis is no longer necessary.



Accumulated production of nitrogen gas by Anammox bacteria immobilized on K5 plastic carriers for different substrate concentrations in the range of 40 to 250 mgN/L.



SAA at different substrate concentrations for Anammox bacteria growing on K5 carriers collected in two different batches (circa two or three weeks between the two batches).