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Abstract

A Flow Injection Methodology for Acetamide Determination Using a Tubular Bioreactor and an Ammonium Sensor †

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Pseudomonas aeruginosa (*P. aeruginosa*) is a Gram-negative bacterium quite versatile that grows in the soil, in coastal marine habitats, as well as in the tissues of plants and animals. *P. aeruginosa* is the source of amidase (acylamide amidohydrolase E.C. 3.5.1.4) which catalyzes the hydrolysis of a small range of short aliphatic amides into the corresponding carboxylic acids and ammonia.

A low cost piezoelectric quartz crystal coated with a selective membrane for ammonium was used to detect the reaction product.

Conversion of amide into the correspondent amine was achieved both with cell-free extract of *P. Aeruginosa* or the whole cells. This conversion was first performed in batch and later on injected into the sensor system where a buffer carrier was flowing over the coated crystal. Another approach consisted in incorporating a conversion reactor with the immobilized cell-free extract of *P. Aeruginosa* in the FIA system. Amide solutions were injected and carried by the buffer stream through the reactor and then directed to the sensor. Different supports were used for immobilization, such as calcium alginate beads, glass beads and the inside walls of a hollow glass column.

The best arrangement allowed acetamide determination without sensitivity lost for 1-month period.