A Direct Spectrophotometric Assay for Evaluating Nitrate-Nitrogen in Intensive Aquaculture Systems

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Abstract

This paper describes a simple spectrophotometric procedure for determining NO₃⁻-N in water samples. In the proposed method, NO₂⁻-N of a water sample is first removed from the water with sulfamic acid. Then, NO₃⁻-N is reduced to NO₂⁻-N using vanadium (III) chloride and a detection reagent is added. When rapid collection of data is necessary, this method can be adapted to a microtechnique using a 96-well microplate, resulting in a detection limit of 5 NO₃⁻-N mg/l. Using a larger volume spectrophotometer cell (5 cm) lowers the detection limit to 0.5 NO₃⁻-N mg/l. The proposed method is applicable for routine analysis of water in aquaculture systems and wastewaters in which medium-high NO₃⁻-N concentrations are expected. Benefits of the method are reduction of the laborious preparation and avoidance of contact with the harmful substances typical of the cadmium reduction method.

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