

# Accepted Manuscript

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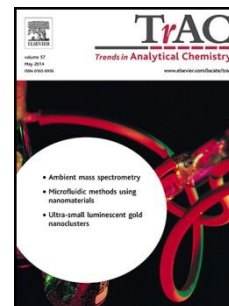
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PII: S0165-9936(14)00084-3

DOI: <http://dx.doi.org/doi:10.1016/j.trac.2014.03.012>

Reference: TRAC 14241

To appear in: *Trends in Analytical Chemistry*



Please cite this article as: Lenka O'Connor Šraj, M. Inês G.S. Almeida, Stephen E. Swearer, Spas D. Kolev, Ian D. McKelvie, Analytical challenges and advantages of using flow-based methodologies for ammonia determination in estuarine and marine waters, *Trends in Analytical Chemistry* (2014), <http://dx.doi.org/doi:10.1016/j.trac.2014.03.012>.

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# Analytical challenges and advantages of using flow-based methodologies for ammonia determination in estuarine and marine waters

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## HIGHLIGHTS

- We outline the marine behavior of ammonia, and the challenges for its analysis
- We summarize the characteristics of flow techniques for marine ammonia analysis
- We describe the advantages of flow techniques for field analysis of ammonia
- We discuss amelioration of sample-matrix effects and sensitivity enhancement

## ABSTRACT

Ammonia is an important nutrient in coastal and oceanic waters due to its role in the aquatic nitrogen cycle. However, the presence of the analyte at trace concentrations (nanomolar) and the high salinity of the water make its analysis a real challenge. Historically, flow-based methodologies, such as segmented flow analysis, and, more recently, flow-injection analysis and sequential injection analysis, have been used to assist with this difficult task. This review explains the importance of the analysis of ammonia in estuarine and marine water samples and the challenges facing the analytical chemist. We describe the flow-based methodologies that have been developed for this particular application. We discuss detection and on-line sample-pretreatment strategies employed to improve the limit of detection and to reduce and eliminate interferences, and illustrate them with examples of field applications.

### *Keywords:*

Ammonia  
Estuarine water  
Flow analysis  
Gas diffusion  
Indophenol blue  
Marine water  
Orthophthaldialdehyde (OPA)  
Sample-matrix effect  
Seawater

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