Supelco®
Analytical Products

Application Note

Nitrate in effluents

Photometric determination

Introduction

Excess nitrate in effluents can be problematic because it can lead to contamination of groundwater and subsequent environmental problems. One of these issues is eutrophication—excessive growth of algae and plants—which can adversely affect aquatic ecosystems.[1] As a result, monitoring nitrate levels is critical for environmental reasons. Here we describe nitrate determination in effluents using photometry and Spectroquant® Nitrate Test Kits.

Experimental

Method

The test kit catalog numbers apply for the following methods:

1.14542; 1.14773: In concentrated sulfuric acid nitrate ions react with a benzoic acid derivative to form a red nitro compound that is determined photometrically.

1.14563; 1.14764; 1.09713: In sulfuric and phosphoric solution nitrate ions react with 2,6-dimethylphenol (DMP) to form 4-nitro-2,6-dimethylphenol that is determined photometrically. The method is analogous to DIN 38405-9.

Reagents and Instruments

Cat. No.	Product Description
Test Kits	
1.14542	Nitrate Cell Test Method: photometric 0.5 - 18.0 mg/l NO_3-N 2.2 - 79.7 mg/l NO_3^- Spectroquant® or
1.14563*	Nitrate Cell Test Method: photometric, DMP 0.5 - 25.0 mg/l NO_3-N 2.2 - 110.7 mg/l NO_3^- Spectroquant® or
1.14764*	Nitrate Cell Test Method: photometric, DMP 1.0 - 50.0 mg/l NO_3-N 4 - 221 mg/l NO_3^- Spectroquant® or
1.14773	Nitrate Test Method: photometric 0.2 - 20.0 mg/l NO_3-N 0.9 - 88.5 mg/l NO_3^- Spectroquant® or
1.09713*	Nitrate Test Method: photometric, DMP 0.10 - 25.0 mg/l NO_3-N 0.4 - 110.7 mg/l NO_3^- Spectroquant®
Instruments	
1.73026	Spectroquant® VIS Spectrophotometer Prove 100 plus or
1.73027	Spectroquant® UV/VIS Spectrophotometer Prove 300 plus or
1.73028	Spectroquant® UV/VIS Spectrophotometer Prove 600 plus or
1.09748	Spectroquant® Photometer NOVA 30 or
1.09751	Spectroquant® Photometer NOVA 60 or
1.09752	Spectroquant® Photometer NOVA 60A or
1.73632	Spectroquant® Colorimeter Move 100
Materials	
1.14946	Rectangular cells 10 mm or
1.14947	Rectangular cells 20 mm or
1.14944	Rectangular cells 50 mm

*not compatible with Move 100

Also first generation Prove instruments are compatible and preprogrammed with this method.

MERCK

Analytical Approach

Sample preparation

Generally:

Items **1.14542** and **1.14773** tolerate high chloride contents samples (> 1000 mg/l). The tolerance of COD is low for both (1 %). Items **1.14563, 1.09713** tolerate high chloride (1000 mg/l) and COD contents (500 mg/l) but no coloration.

Cloudy samples must be filtered before determination.

Analysis

Determine with the above-mentioned test kits.

Calculation

Nitrate content in mg/l NO_3-N = analysis value in mg/l NO_3-N.

References

1. Camargo JA, Alonso A. Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. Environ Int. Aug 2006;32(6):831-49. doi:10.1016/j.envint.2006.05.002.

To place an order or receive technical assistance

In Europe, please call Customer Service:
France: 0825 045 645
Germany: 069 86798021
Italy: 848 845 645
Spain: 901 516 645 Option 1
Switzerland: 0848 645 645
United Kingdom: 0870 900 4645

For other countries across Europe, please call: +44 (0) 115 943 0840
Or visit: **MerckMillipore.com/offices**
For Technical Service visit: **MerckMillipore.com/techservice**

MerckMillipore.com

Merck KGaA
Frankfurter Strasse 250
64293 Darmstadt, Germany

MK_AN8763EN Ver. 1.0
39131
01/2024