

**Summary:**

Nitrate is reduced quantitatively to nitrite by cadmium metal. The nitrite formed, in addition to any nitrite originally present in the sample, is diazotized with sulfanilamide and subsequently coupled with *N*-1-naphthylethylenediamine dihydrochloride. The resulting highly colored azo dye is colorimetrically detected at 540 nm. Nitrite singly may be measured by performing the same analysis but without the cadmium reduction. Without the cadmium, nitrate is not reduced to nitrite and is not detected since only nitrite forms the azo dye.

**Interferences:**

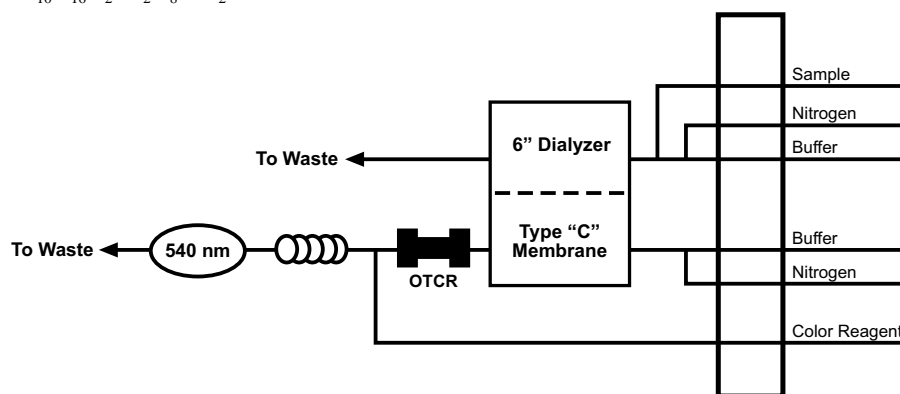
Filter turbid samples prior to analysis. Ethylenediaminetetraacetic acid (EDTA) is used in the buffer solution to eliminate interference from iron, copper, and other metals. Adjust the pH of the samples within a range of 5–9 using either concentrated hydrochloric acid or ammonium hydroxide. Samples containing large concentrations of oil and grease must be extracted with an organic solvent. Samples containing sulfide cannot be determined without first removing the sulfide by precipitation with cadmium salts.

**Performance Specifications:**

Range:	0.1–50 mg/L
Throughput:	29 samples/hour
Precision:	
0.1 mg/L	<2% RSD
1.0 mg/L	<1% RSD
10 mg/L	<1% RSD
50 mg/L	<1% RSD
Method Detection Limit (MDL):	0.004 mg/L

**Chemicals:**

Ammonium Chloride, $\text{NH}_4\text{Cl}$	Hydrochloric Acid, concentrated, HCl
Ammonium Hydroxide, $\text{NH}_4\text{OH}$	<i>N</i> -(1-naphthyl)ethylenediamine
Brij®-35, 30% w/v (OI Analytical Part #A21-0110-33)	Dihydrochloride, $\text{C}_{12}\text{H}_{14}\text{N}_2 \cdot 2\text{HCl}$
Chloroform, $\text{CHCl}_3$	Phosphoric Acid, concentrated (85%), $\text{H}_3\text{PO}_4$
Cupric Sulfate Pentahydrate, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$	Potassium Nitrate, $\text{KNO}_3$
Ethylenediaminetetraacetic Acid, Disodium Salt Dihydrate (EDTA), $\text{C}_{10}\text{H}_{16}\text{N}_2\text{Na}_2\text{O}_8 \cdot 2\text{H}_2\text{O}$	Potassium Nitrite, $\text{KNO}_2$
	Sulfanilamide, $\text{C}_6\text{H}_8\text{N}_2\text{O}_2\text{S}$

**Basic Flow Diagram:****Selected Reference:**

*Methods for the Chemical Analysis of Water and Wastes*; EPA/600/R-79-020; U.S. Environmental Protection Agency, Office of Research and Development, Environmental Monitoring and Support Laboratory: Cincinnati, OH, 1984; Method 353.2.

Brij is a registered trademark of ICI Americas.