

**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 (SAN) and subsequently coupled with *N*-1-naphthylethylenediamine dihydrochloride (NED). 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. Imidazole 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.

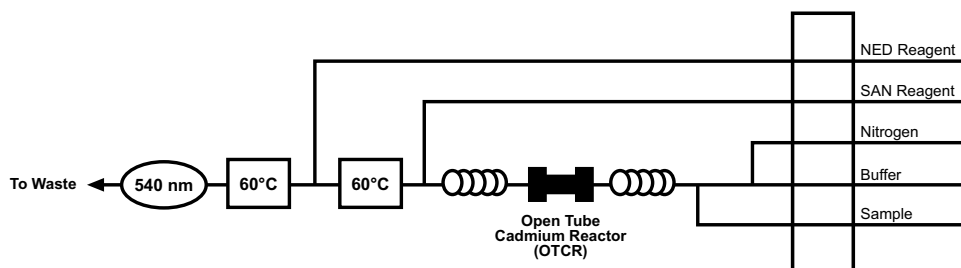
**Performance Specifications:**

Range:	0.02–40 µmoles/L
Throughput:	36 samples/hour
Precision:	
0.02 µmoles/L	<10% RSD
40 µmoles/L	<1% RSD
Method Detection Limit (MDL):	0.007 µmoles/L

**Chemicals:**

Brij®-35, 30% w/v (OI Analytical Part #A21-0110-33)	<i>N</i> -(1-naphthyl)ethylenediamine Dihydrochloride, C <sub>12</sub> H <sub>14</sub> N <sub>2</sub> •2HCl
Cupric Sulfate Pentahydrate, CuSO <sub>4</sub> •5H <sub>2</sub> O	Potassium Nitrate, KNO <sub>3</sub>
Hydrochloric Acid, concentrated, HCl	Potassium Nitrite, KNO <sub>2</sub>
Imidazole, C <sub>3</sub> H <sub>4</sub> N <sub>2</sub>	Sodium Chloride, NaCl
Magnesium Sulfate Heptahydrate, MgSO <sub>4</sub> •7H <sub>2</sub> O	Sodium Hydroxide, NaOH
	Sulfanilamide, C <sub>6</sub> H <sub>8</sub> N <sub>2</sub> O <sub>2</sub> S

**Basic Flow Diagram:**



**Selected References:** *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.

*Standard Methods for the Examination of Water and Wastewater*, 20th ed.; American Public Health Association: Washington, D.C., 1998.

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