

Summary: The sample, buffered at pH 9.5 with borate buffer, is distilled. The generated ammonia gas passes through a gas diffusion membrane and is absorbed into a dilute sulfuric acid solution. Ammonia reacts with alkaline phenol and hypochlorite to form indophenol blue in an amount that is proportional to the ammonia concentration. Sodium nitroferrocyanide intensifies the blue color. Measure the absorbance at 660 nm.

Interferences: Eliminate most interferences by distilling the sample at pH 9.5 and passing it through a gas diffusion membrane. Filter turbid samples prior to analysis. Samples with background absorbance at the analytical wavelength may interfere. Color intensity is sensitive to pH. Standardize samples at pH 5–7 prior to analysis, or add extra sodium hydroxide to the buffer solution.

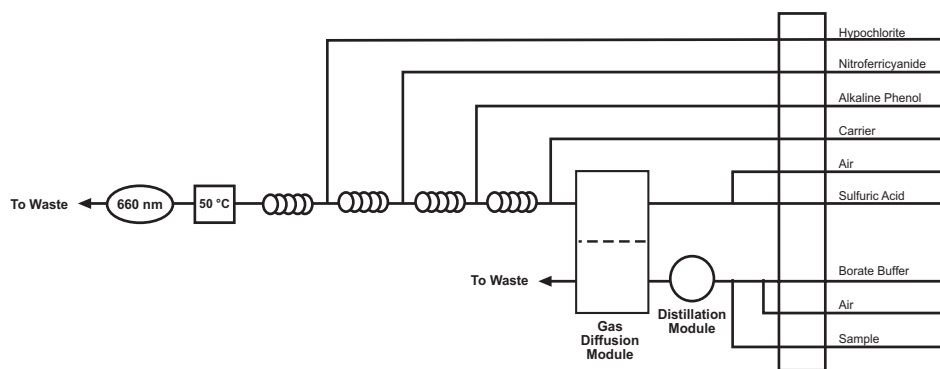
Performance Specifications:

Range	0.1–5.0 mg/L N
Throughput	40 samples/hour
Precision at 0.5 mg/L	<5% RSD
5.0 mg/L	<3% RSD
Method Detection Limit (MDL)	0.03 mg/L

Chemicals:

Ammonium sulfate, (NH ₄) ₂ SO ₄	Sodium hydroxide, NaOH
Brij [®] -35, 30% w/v (OI Analytical PN A21-0110-33)	Sodium hypochlorite, 5.25% available chlorine (household bleach), NaOCl
Chloroform, CHCl ₃	Sodium nitroferrocyanide dihydrate, Na ₂ Fe(CN) ₅ NO•2H ₂ O
Kleenflow™ Acidic (OI Analytical PN A001251)	Sodium tetraborate, Na ₂ B ₄ O ₇ or sodium tetraborate decahydrate, Na ₂ B ₄ O ₇ •10H ₂ O
Kleenflow Basic (OI Analytical PN A001252)	Sulfuric acid, concentrated, H ₂ SO ₄
Phenol, solid or liquified, 88%, C ₆ H ₅ OH	

Basic Flow Diagram:



Note: This method complies with USEPA Method 350.1

Selected References:

Nitrogen, Ammonia. *Methods for Chemical Analysis of Water and Wastewater*; EPA-600/4-79-020; U.S. Environmental Protection Agency, Office of Research and Development, Environmental Monitoring and Support Laboratory: Cincinnati, OH, 1984; Method 350.1.

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

Brij is a registered trademark of ICI Americas.
Kleenflow is a trademark of Ricca Chemical.