

CNSolution™ Cyanide Analyzers



Technology Leader in Cyanide Analysis



OI Analytical has been a leader in cyanide analysis instrumentation since 1990. Research supported by OI has made significant contributions to the science of cyanide analysis and the reliability of cyanide testing methods.

USEPA Method OIA 1677 for Available Cyanide was developed by OI Analytical in cooperation with the University of Nevada – Reno, Mackay School of Mines.¹ The method was approved for NPDES reporting on December 30, 1999 and SDWA reporting on March 12, 2007.^{2,3}

The USEPA has acknowledged the distillation step used in some methods actually causes analytical interferences, stating; "If sulfite or thiosulfite are present there is no way to accurately determine cyanide if heat is applied".⁴ OI has helped develop new methods that mitigate interferences arising in the sampling, processing, and measurement steps of older methods. An example is ASTM D 7511-09e2 for Total Cyanide.⁵ This method is in the proposed Methods Update Rule (MUR) of new 40 CFR 136 Clean Water Act methods for regulatory compliance testing of NPDES wastewater samples.⁶

Application / Methodology

Drinking Water – SDWA Available (A) & Total (T) Cyanide

Wastewater – NPDES Available (A) & Total (T) Cyanide

Air / Gas Samples / ASTM D 7295-06

USEPA OIA-1677 / ASTM D 6888-04 Available Cyanide

ASTM D 7511-09e2 Total Cyanide

USEPA 335.4 Total Cyanide – Post Distillation

ASTM D 7284-08 Total Cyanide – Post Distillation

ISO-14403-2002 Total Cyanide and Free Cyanide

Aquatic Free Cyanide / ASTM D 7237-06

Weak Acid Dissociable (WAD) Cyanide – SM-4500-CN-I

CATC – Cyanide Amenable to Chlorination – SM-4500-CN-G

Soil & Solid Waste Extracts

¹ *Rapid Distillationless "Free Cyanide" Determination by a Flow Injection Ligand Exchange Method*, Environ. Sci. Technol. Vol. 29, No.2, 426-430, 1995.

² *Federal Register*, Vol. 64, No. 250, December 30, 1999.

³ *Federal Register*, Vol. 72, No. 47, March 12, 2007

⁴ *Solutions to Analytical Chemistry Problems with Clean Water Act Methods*, USEPA Office of Science and Technology, March 2007.

⁵ *D 7511-09e2 Standard Test Method for Total Cyanide by Segmented Flow Analysis, In-line Ultraviolet Digestion and Amperometric Detection*, ASTM International, 2009.

⁶ *Federal Register*, Vol. 75, No. 184, September 23, 2010

Solutions for All Applications

OI Analytical CNSolution™ Cyanide Analyzers are configurable to support virtually all applications and regulatory methods. Four different CNSolution™ system configurations are described in the accompanying table. These configurations are based upon the analysis technique and detection method each is equipped to perform.

A hydrogen cyanide molecule symbol  identifies the appropriate CNSolution™ configuration for particular applications and regulatory methods.

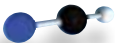
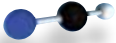
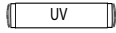
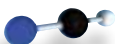
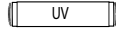
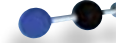
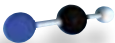
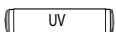
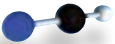
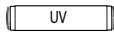
Methods that employ an automated in-line UV digestion step are identified with a UV lamp symbol. 

Methods that require a separate manual distillation step prior to analysis are identified with a distillation apparatus symbol. 

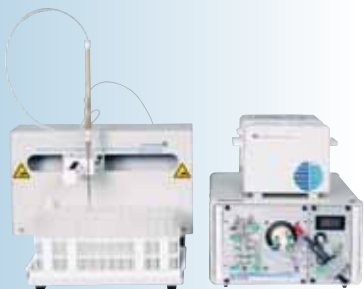
The Dual Channel configuration measures available cyanide by amperometric detection and total cyanide by photometric detection. The second photometric channel also enables users to perform different colorimetric chemistries and measure other analytes (e.g., Ammonia Nitrogen, Nitrate/Nitrite, Total Phosphorus, and Orthophosphate) using the same system.

Pictures and descriptions of the four CNSolution™ Cyanide Analyzer configurations in the table are provided on the back of this brochure.

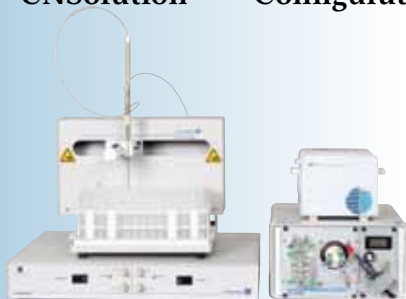
CNSolution™ Analyzer Configurations

Configuration 1 <i>Gas Diffusion Amperometric Detection</i>	Configuration 2 <i>In-line UV Digestion Gas Diffusion Amperometric Detection</i>	Configuration 3 <i>Dual Channel Analyzer Amperometric Detection + Photometric Detection</i>	Configuration 4 <i>Colorimetric Reaction Photometric Detection</i>
  (A)		  (A / T)	
 (A)	  (T)		
			
			
	 		
 			 
			  
			
		 	   
	 		

CNSolution™ Cyanide Analyzers



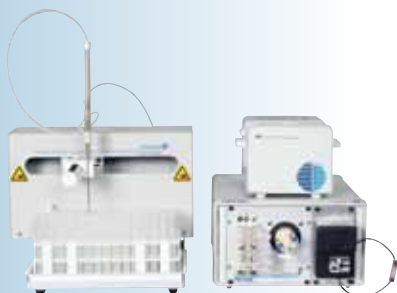
CNSolution™ – Configuration 1



CNSolution™ – Configuration 2



CNSolution™ – Configuration 3



CNSolution™ – Configuration 4

A compact, modular design allows CNSolution Cyanide Analyzers to be configured for virtually all applications and regulatory methods. The modular design also provides users flexibility to add an additional analysis channel to any of the single channel CNSolution analyzer configurations shown here.

CNSolution™ – Available Cyanide Analyzer

The CNSolution Available Cyanide Analyzer measures available cyanide by gas diffusion amperometry in accordance with USEPA Method OIA-1677 and ASTM D 6888-04, and total cyanide by ASTM D 7284-08.

CNSolution™ – Total Cyanide Analyzer

The CNSolution Total Cyanide Analyzer measures total cyanide by in-line UV digestion and gas diffusion amperometry in accordance with USEPA-approved method ASTM D 7511-09e2.

CNSolution™ – A/P Dual Channel Cyanide Analyzer

The CNSolution A/P Dual Channel Cyanide Analyzer is configured to measure available cyanide by gas diffusion amperometry and total cyanide by photometric detection. The second channel equipped with a photometric detector enables users to perform automated colorimetric chemistries and measure other analytes using the same system.

CNSolution™ – Post-Distillation Total Cyanide Analyzer

The CNSolution Post-Distillation Total Cyanide Analyzer measures total cyanide in samples that have been distilled, using colorimetric reagents and photometric detection in accordance with USEPA Method 335.4.



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