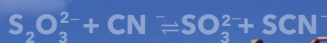
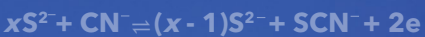
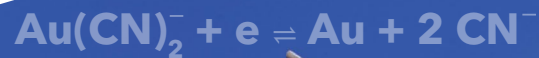


xylem



# CNSolution™ 9310 Online Cyanide Analyzer

BROCHURE  
3765-01

O·Analytical   
a xylem brand

# CNSolution™ 9310

## Accurate measurement of cyanide in leaching solutions



Accurately measuring cyanide available for leaching precious metal ores containing copper and metallic sulfides is problematic. Copper complexes with cyanide, reducing the cyanide available for leaching. Titration methods commonly used for process control in gold leaching poorly estimate the amount of cyanide available when copper is present.<sup>1</sup> Other reaction products including thiocyanate, nitrate, nitrite, ammonia, and sulfur (IV) oxides interfere with most cyanide analysis methods.<sup>2</sup>



The OI Analytical CNSolution 9310 Online Cyanide Analyzer is designed to measure available cyanide in precious metal leaching solutions by U.S. EPA Method OIA-1677<sup>3</sup>, a method developed by chemists at OI Analytical in conjunction with the University of Nevada-Reno Mackay School of Mines, and ASTM D 6888-09<sup>4</sup>.

The gas-diffusion amperometry technique in these methods has been demonstrated to be free of interferences from copper and metallic sulfides in precious metal leaching solutions.<sup>5</sup>

The system features Teflon® tubing and a simple plumbing configuration, which makes walk up sampling easy and straightforward. The CNSolution 9310 is the easiest-to maintain online cyanide analyzer.

Online monitoring with the CNSolution 9310 enables gold and silver mills to reduce both cyanide consumption and the operating costs associated with the cyanidation process.

## CNSolution 9310 Deployment in Precious Metal Cyanidation

The CNSolution 9310 supports the measurement and control of cyanide in multiple cyanidation unit operations as shown in this process diagram.

1. Cyanide Addition
2. Leaching
3. Cyanide Recycle
4. Detoxification
5. Effluent Discharge/Tailings

# Reliable data for process control

In operation, a filtered slurry sample is drawn into the CNSolution 9310 to fill a fixed volume loop. A base reagent is continuously pumped through one side of a gas diffusion module equipped with a hydrophobic membrane and out through the flow cell of an amperometric detector.

Sample in the loop is injected into an acidic carrier stream. The acidic conditions convert  $CN^-$  in the sample to hydrogen cyanide (HCN) gas. The HCN gas diffuses across the hydrophobic membrane into the base reagent where it converts back to  $CN^-$  and enters the flow cell of

the amperometric detector. Cyanide ions react with the silver electrode and generate a current proportional to the cyanide concentration. The detector response for each sample is displayed in real-time as a peak on the touch-screen display and can be output to a Supervisory Control and Data Acquisition (SCADA) system.

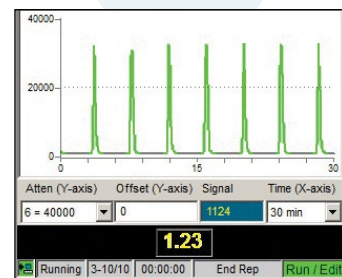
Data can be output to a LAN network in a Microsoft® Excel® - ready .csv format or retrieved using a USB memory stick.



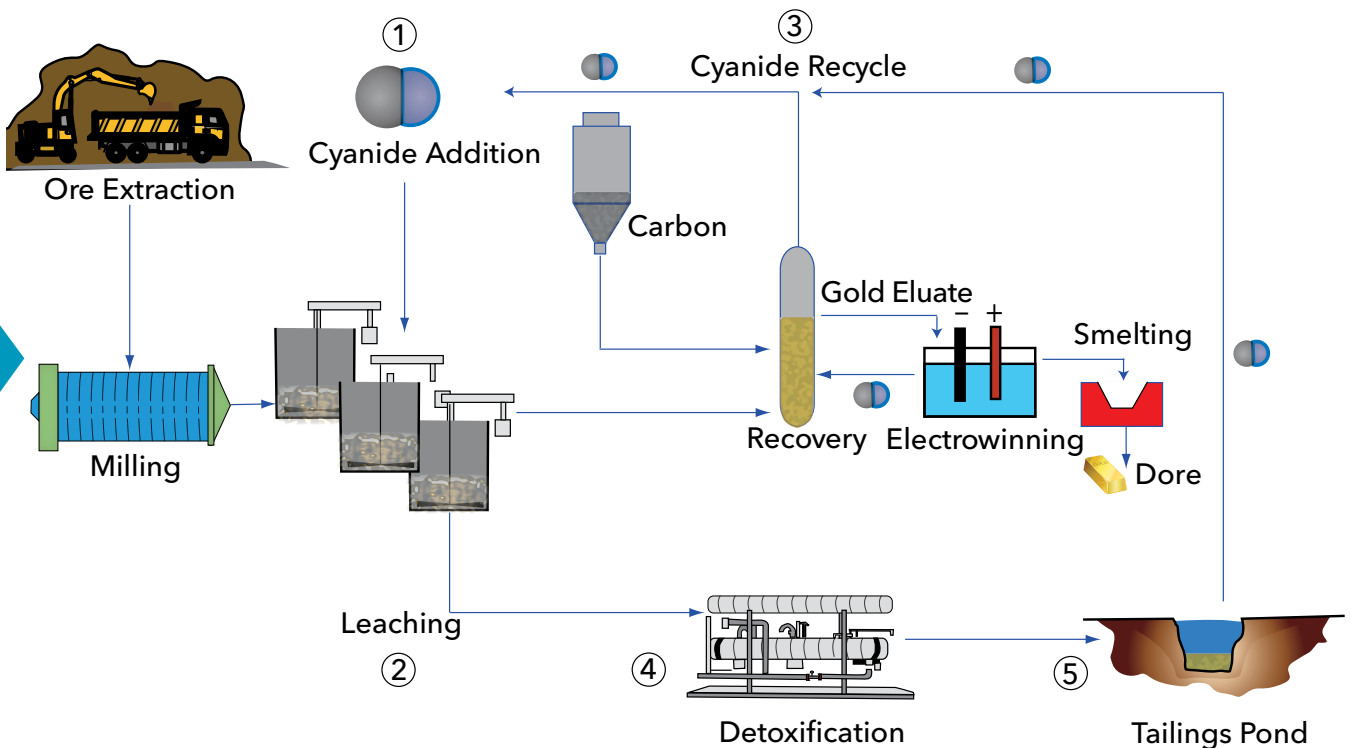
Start/Edit Screen



Run Screen



Detector Response



# CNSolution™ 9310 Specifications

|                              |  |
|------------------------------|--|
| <b>Operating Principle</b>   | FIA by gas diffusion amperometry                                   |
| <b>Measurement Technique</b> | Amperometric detection - silver electrode                          |
| <b>Measurement Ranges</b>    | 0.2 to 50 / 2.0 to 500 / 20 to 2000 ppm CN                         |
| <b>Reference Methods*</b>    | USEPA OIA-1677 / ASTM D 6888-09 (Available CN)                     |
| <b>Calibration</b>           | 2 point calibration  |
| <b>Measurement Accuracy</b>  | ± 5% at 50-ppm   |
| <b>Sample Introduction</b>   | Continuous online fill-and-spill sampling system                   |
| <b>Sampling Interval</b>     | User programmable  |
| <b>Analysis Time</b>         | <3 minutes   |
| <b>Operating Environment</b> | 5 - 45 °C, up to 90% humidity (non-condensing)                     |
| <b>Operator Interface</b>    | Windows® CE-based, Color touch-screen display                      |
| <b>Reagents Required</b>     | Water, NaOH, HCl, CN <sup>-</sup> calibration standards            |
| <b>Power Requirements</b>    | 24VDC  |
| <b>Output Relays</b>         | 2 (system alarm, sample alarm)                                     |
| <b>Analog Output</b>         | (2) 4-20mA (user-configurable concentration)                       |
| <b>Data Export</b>           | To PC via Ethernet, or using USB memory stick                      |
| <b>Instrument Enclosure</b>  | NEMA 4X / IEC Class IP-56  |
| <b>External Dimensions</b>   | 48.3 cm H x 31.1 cm W x 31.1 cm D<br>(19" H x 12.25" W x 12.25" D) |
| <b>Weight</b>                | 11 kg (24 lbs.)  |

\* Free Cyanide ASTM D7237-10 and Total Cyanide ASTM D 7511-12 configurations are available. Contact OI Analytical customer support for information.



**CNSolution 3700 Laboratory Cyanide Analyzer**  
 The Lab Solution™ 3700 Laboratory Cyanide Analyzer performs the same gas-diffusion amperometry technique used in the CNSolution™ 9310 for calibration checks and confirmatory testing of grab samples.

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