

Cyanide Chemistry & Analysis Training Course

MINERAL RESOURCES FLAGSHIP
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This 2 day training course will provide you with a detailed understanding of cyanide chemistry and hands-on practice on “State of the Art” analysis techniques for Free, WAD and Total cyanide. The training will alternate between short lectures and hands-on analysis and interpretation. A training manual will be provided covering the lecture material, references, analysis examples and worksheets.

Course Outline

Chemistry of cyanide solutions

Sampling, preservation, packaging, transportation, storage

Cyanide ion analysis

- Titration with silver nitrate, Colorimetric, Ion selective electrode, Amperometric

Cyanide analysis methods (laboratory and on-line)

- Free cyanide analysis
 - Silver nitrate titration (indicator and potentiometric end-points)
 - Amperometric (with/without gas diffusion)
- WAD cyanide analysis
 - Picric acid
 - Distillation
 - Ligand exchange (with/without gas diffusion)
- Total cyanide analysis
 - Distillation
 - UV digestion with gas diffusion

Accuracy and detection limits

Interferences

Hands on analysis using titration, picric acid, CNSolution™ Cyanide Analyser and Orica Cyantific™ analyser

Interpretation of analysis results and reconciliation with metal ion analysis

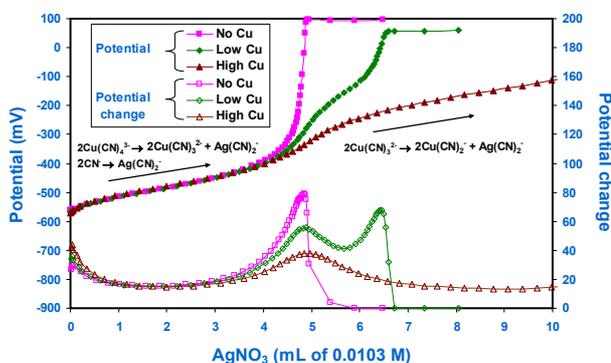


Figure 1: Potentiometric titration of 20 mL samples containing 250 mg/L NaCN; low Cu – 100 mg/L Cu as $\text{Cu}(\text{CN})_2^{2-}$, high Cu – 500 mg/L Cu as $\text{Cu}(\text{CN})_2^{2-}$.

Course Fee

AU\$2700+GST per person (lunch & Tea breaks included)
Group booking discount available

Location

Australian Minerals Research Centre, 7 Conlon Street,
Waterford 6152

Contact (for further information & expression of interest)

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In conjunction with



Course Presenters

Dr Paul Breuer (Principal Research Scientist, CSIRO): Paul obtained a BSc, BE, MEng and PhD from Monash University. He joined CSIRO in 2004 and has been the lead researcher of gold cyanidation activities within the Minerals Down Under National Research Flagship. Paul has in-depth knowledge of cyanide chemistry and speciation and cyanide analysis techniques and methods. His expertise with both laboratory and on-line analysers has been applied in the gold industry to troubleshoot analysis problems, interferences and provide interpretations and understanding to the leach and cyanide destruction processes. Paul was a working group member of the Australian Government “Cyanide Management” leading practise handbook and has published and presented widely on cyanide analysis within the gold industry.



Dr Silvia Black (Senior Chemist and Research Officer, ChemCentre; FAusIMM; FRACI): Silvia obtained a BSc from Curtin University, a Grad Dip from University of NSW and a PhD from Murdoch University. She joined ChemCentre in 1989 and has expertise in environmental science with emphasis in the gold mining industry, particularly with cyanide and thiosulphate processes. Silvia was a principal researcher in the AMIRA Project P497a titled “Cyanide Waste Management: Minimising Environmental and Economic Impacts”. She has published in reputable scientific journals and presented papers nationally and internationally. Her expertise in cyanide chemistry has been recognised nationally and internationally through her participation in committees in Standards Australia and in the International Organization of Standardization (ISO).



Dr Xianwen Dai (Research Scientist, CSIRO): Xianwen obtained a BE from Wuhan University, a ME from Chinese Academy of Sciences and a PhD from Monash University. He joined CSIRO in 2006 as a post-doc and is now a senior research scientist in gold hydrometallurgy and a research project leader in the Minerals Down Under National Research Flagship. His research interests include processing of gold using cyanide or thiosulfate, leaching and electrochemistry of gold, resin and carbon adsorption and elution, and recovery of cyanide from gold cyanidation processes. Xianwen has developed an analysis technique for measuring copper cyanide speciation and has used many of the cyanide analysis techniques throughout his research.



Ms Danielle Hewitt (Project Officer, CSIRO): Danielle has been working at CSIRO since completing her Bachelor of Science (Applied Chemistry) with Honours at Curtin University of Technology in 2005. Danielle is a key member of the gold hydrometallurgy team in the Minerals Down Under National Research Flagship and has been researching cyanide destruction processes. She has developed HPLC methods for analysis of cyanide species and cyanide reaction products and has a strong knowledge and experience with the various cyanide analysis techniques and methods. Danielle has provided on-site analysis support for the gold industry along with analysis of cyanide species to verify on-site analyses and provide additional information.



This course will be of interest to:

- Gold mining industry
- Plant metallurgists
- Environmental scientists and managers
- Analysis and hydrometallurgical laboratories
- Electro-plating industry
- Petroleum refineries
- Research scientists and PhD students

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FOR FURTHER INFORMATION

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