



Sample dilution in preparation for ICP analysis

 A 9001 AND 14001 CERTIFIED COMPANY

## LABORATORY CAPABILITIES

CM Solutions has a unique laboratory offering. We do test work, interpret it, model it and incorporate the results in metallurgical designs. Our integrated team approach ensures our analytical and metallurgical departments function as one unit, making turnaround times faster and client relations more effective.

Laboratory work covers the physical processes, such as crushing, grinding, gravity separation, flotation and classification, and the hydrometallurgical processes, such as leaching, precipitation, solvent extraction and electrowinning.

We have worked in a wide range of metals such as: copper, cobalt, nickel, gold, platinum-group metals, zinc and lead.

Our clients include: Anglo American, Lonmin Platinum, Impala Platinum, First Quantum Minerals (Kansanshi), ERG Africa, Johnson Matthey, Hatch, Bateman, Worley Parsons, SNC Lavalin, Glencore, BASF, Kipoi, Multotec and Chambishi.

### PROCESS DEVELOPMENT

- ▲ Development and execution of the metallurgical test plan
- ▲ Interpretation and modelling of test results
- ▲ Integration of test results in metallurgical design/plant operation

### ANALYTICAL

- ▲ ICP-OES – multi-element analysis, including organics
- ▲ Microwave digestion system for solids
- ▲ Fire assay (traditional and with solvent extraction)
- ▲ Auto dilution system for sample preparation
- ▲ Wet chemistry, titration, distillation (osmium)
- ▲ Particle size distribution (PSD)
- ▲ pH, Eh, conductivity, TDS and turbidity
- ▲ Water analysis
- ▲ Optical microscopy

Sample analysis on the ICP and sample placement into the fire assay furnace



To find out how the CMS laboratory can help you, contact us at [consultants@cm-solutions.co.za](mailto:consultants@cm-solutions.co.za)  
**00 27 (11) 608 0019 | [www.cm-solutions.co.za](http://www.cm-solutions.co.za)**

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## MINERAL PROCESSING

AREA	EQUIPMENT AND TESTS
Flotation	Flotation rate, grade-recovery
Crushing	Crusher (jaw) and roll
Milling	Mill (rod and ball), milling curves
DMS / Heavy liquid	Float and sink analysis
T-type classification	Pilot test rig
Cyclone	Pilot test rig
Dewatering plant	Pilot test rig
Shaking	Shaking table
Spiral	Spiral test rig
Attritioning	Test rig

## SOLID LIQUID SEPARATION

AREA	TESTS	EQUIPMENT
Thickening	Settling test, Underflow density test Flocculant screening	Cylinder
Filtration	Filtration rate Filterability	Filter

## PYROMETALLURGY

AREA	TESTS	EQUIPMENT
Roasting	Sulfides, etc	Muffle furnace
Calcining	Lime	Tube furnace

## HYDROMETALLURGY

AREA	TESTS	EQUIPMENT
Leaching	Atmospheric Cyanidation Pressure Oxidation Heap Constant redox HPAL Oxygen consumption	Open tanks Closed tanks Bottle roll Parr Columns REDOSTAT Parr
	Gangue acid consumption Total acid consumption TCLP	Open tanks Open tanks End-over-end bottle roll
Agitation	Suspension, rheology	Viscometer
Precipitation	Batch tests Continuous tests pH Control Lime, MgO, NaSH	Open and closed tanks
Solvent extraction	Isotherms Organic testing Diluent testing	Shake flasks Pilot plant
Ion exchange	Isotherms Kinetics	Shake flasks Columns
Electrowinning	Anode materials Cathode Chemistry Cell design	Cells
Carbon adsorption	Isotherms Kinetics	Open tanks

Preparing the rod mill  
and performing wet chemistry tests



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