Copper ores and concentrates

Comparison of accuracy on ARL XRF and wet chemistry.
Pressed Powders

The following results were obtained on an ARL 8400 S instrument in Poland for the analysis of samples during the copper concentration process.

These values show that the XRF accuracy of analysis compares well with the wet chemistry analysis even though pressed pellet preparation has been used. Of course such results can only be obtained if we get well analysed samples of the various materials. These materials must come from the process itself. The best results will be obtained if the calibration is done on site because the sample preparation equipment is the same for the calibration samples and for the production samples.

Using these rules we can get at least as good results as the appended results on an ARL Advant'X sequential XRF instrument or an ARL 9900 sim-seq XRF instrument.

Note that a Primary beam filter (PBF) is used for the Ag analysis using the Rhodium anode X-ray tube.

Copper Concentrates: Finished Product			
Element	Range	XRF Accuracy	Wet Chemistry Accuracy
	%	%	%
Ag	0.05 - 0.06	0.001	0.002
As	0.065 - 0.08	0.0027	0.01
Cu	21.8 - 26.2	0.58	0.3
Fe	3.3 - 3.6	0.07	0.15
Pb	1.9 - 2.2	0.03	0.1
S	9 - 10.5	0.09	0.3
Si	8 - 9	0.27	0.2
Zn	0.52 - 0.6	0.018	0.02

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Copper Concentrates: Intermediate Product			
Element	Range	XRF Accuracy	Wet Chemistry Accuracy
	%	%	%
Ag	0.03 - 0.07	0.001	0.002
Cu	15 - 32	0.5	0.3
Fe	2.8 - 4.0	0.12	0.15
Pb	1.5 - 2.5	0.03	0.1
S	6.5 - 12.5	0.38	0.3
Si	7 - 10.2	0.28	0.2
Zn	0.4 - 0.7	0.026	0.02

Copper Concentrates: Feeding Material		
Element	Range	XRF Accuracy
	%	%
Ag	0.002 - 0.007	0.0003
Cu	1.0 - 2.5	0.076
Fe	0.7 - 1.1	0.035
Pb	0.15 - 0.27	0.006
S	1 - 1.9	0.1
Si	15 - 25	0.38
Zn	0.04 - 0.07	0.0023
Al	2 - 3	0.037
Mg	2.7 - 5.2	0.24
Ca	8 - 14.3	0.19