



INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department

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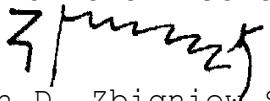
CERTIFICATE OF ANALYSIS

Copper of higher purity

The average results of chemical analyses in ppm

No. Element	CF 1	CF 2	CF 3	CF 4	CF 5	CF 6
As	6,7	1,1	1,8	43,0	2,3	0,32
Sb	24,0	1,4	2,2	11,0	1,9	0,2
Pb	33,0	0,6	8,9	1,1	3,2	1,8
Sn	21,0	--	3,2	1,0	1,3	(0,06)
Ni	29,0	0,7	6,4	7,8	3,0	(0,4)
Bi	12,5	--	--	1,2	0,25	(0,012)
Fe	42,0	2,8	20,0	3,7	98,0	1,0
Zn	57,0	2,2	3,4	31,0	4,7	--
Ag	45,0	9,0	3,2	18,0	12,0	12,0

Director of the Institute


Prof. Ph.D. Zbigniew Śmieszek

The confidence intervals in ppm at the probability level of 0,05

No. Element	CF 1	CF 2	CF 3	CF 4	CF 5	CF 6
As	0,55	0,11	0,16	3,8	0,20	0,057
Sb	0,5	0,086	0,12	0,74	0,29	--
Pb	1,5	0,17	0,55	0,3	0,34	0,14
Sn	1,6	--	0,28	0,064	0,10	--
Ni	2,1	0,068	0,39	0,54	0,26	--
Bi	1,0	--	--	0,21	0,038	--
Fe	2,3	0,071	0,12	0,30	1,4	--
Zn	3,2	0,30	0,37	3,0	0,35	--
Ag	0,59	0,29	0,27	0,10	0,42	7,0

Analytical methods applied:

- As - spectrophotometric with ammonium molybdate
- Sb - spectrophotometric with crystal violet
- Pb - spectrophotometric with dithizone, atomic absorption
- Sn - spectrophotometric with phenylfluoran
- Ni - atomic absorption
- Bi - spectrophotometric with dithizone
- Fe - atomic absorption
- Zn - spectrophotometric with dithizone, atomic absorption
- Ag - titration with dithizone, atomic absorption

The chemical analyses have been carried out in four industrial laboratories and at the Institute of Non-Ferrous Metals.

The set consists of 6 reference materials in form of rods 6 mm and 3 mm in diameter and 100 mm long.