INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department
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CERTIFICATE OF ANALYSIS

Tin copper

The average results of chemical analyses in wt %

No. / Element	CM 1	CM 2	CM 3	CM 4	CM 5
Sn	0,61	0,84	1,06	1,30	1,14
Fe	0,019	0,0064	0,012	0,0042	0,0094
Ni	0,0086	0,0055	0,0031	0,0011	0,014
Zn	0,021	0,0061	0,0060	0,0020	0,013
As	0,0098	0,0068	0,0036	0,0011	(0,015)
Sb	0,012	0,0068	0,0040	0,0019	0,018
Pb	0,012	0,0067	0,0038	0,0023	0,019
Bi	0,010	0,0072	0,0033	0,00093	0,014
P	0,0088	0,0058	0,0041	0,0009	0,015
Ag	0,010	0,0061	0,0029	0,0011	---
Cu	the rest	the rest	the test	the rest	the rest

Director of the Institute

Prof. Ph.D. Zbigniew Śmieszek

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

No. / Element	CM 1	CM 2	CM 3	CM 4	CM 5
Sn	0,013	0,018	0,034	0,035	0,027
Fe	0,0013	0,00042	0,00087	0,00031	0,00051
Ni	0,00023	0,00071	0,00033	0,000040	0,00084
Zn	0,00059	0,00035	0,00025	0,00012	0,0013
As	0,00015	0,00036	0,00025	0,00019	---
Sb	0,0075	0,00053	0,00033	0,00016	0,0023
Pb	0,0013	0,00012	0,00033	0,00020	0,00074
Bi	0,00025	0,00068	0,00041	0,000052	0,00094
P	0,00032	0,00027	0,00039	0,000072	0,00031
Ag	0,00042	0,00035	0,00042	0,00014	---

Analytical methods applied:

Sn - atomic absorption
Fe - atomic absorption,
Ni - atomic absorption, spectrometric
Zn - atomic absorption, spectrophotometric
As - distillation with spectrophotometric and spectrometric method
Pb - atomic absorption, spectrometric
Bi - atomic absorption, spectrometric
P - spectrophotometric, spectrometric, titration
Ag - atomic absorption, spectrometric

The chemical analyses have been carried out in three industrial laboratories and in Institute of Non-Ferrous Metals.
The set consists of 5 reference materials in form of discs 40 mm in diameter and 30 mm in height.