



INSTITUTE OF NON-FERROUS METALS

Analytical Chemistry Department
44-101 Gliwice, ul. Sowińskiego 5

CERTIFICATE OF ANALYSIS

Cupro - nickel MN5

The average results of chemical analysis in wt %

Element	No.	MN1	MN2	MN3	MN4
Ni		3,21	4,50	5,29	5,90
Pb		0,0062	0,012	0,016	0,024
Fe		0,0041	0,033	0,062	0,083
P		(0,00027)	0,010	0,016	0,026
As		(0,0007)	0,0011	(0,0017)	(0,0038)
Sb		0,00019	(0,00078)	0,0013	0,0019
Bi		0,00011	0,00071	0,0012	0,0018
Cu		the rest	the rest	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

Element	No.	MN1	MN2	MN3	MN4
Ni		0,051	0,10	0,058	0,10
Pb		0,00047	0,00094	0,0011	0,0021
Fe		0,0014	0,00038	0,0024	0,00057
P		-	0,0017	0,0024	0,0013
As		-	0,00011	-	-
Sb		0,0000013	-	0,00013	0,00022
Bi		0,00000051	0,00012	0,000056	0,000085

Analytical methods applied:

Ni - weight method, AAS atomic absorption spectrometry

Pb - AAS atomic absorption spectrometry

Fe - AAS atomic absorption spectrometry

P - spectrophotometric

As - AAS atomic absorption spectrometry, spectrophotometric

Sb - AAS atomic absorption spectrometry, spectrophotometric

Bi - AAS atomic absorption spectrometry

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

Melts have been performed using induction furnace.

CRMs are in form of discs 35 mm in diameter and 30 mm height.

Homogeneity was estimated statistically with application of test F.

Investigation were carried out using atomic emission spectrometry method with low voltage spark.

Application CRMs – Atomic emission spectrometry

CRMs are stable in time.