



# INSTITUTE OF NON-FERROUS METALS

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CERTIFICATE OF ANALYSIS

*Preliminary alloy Cu-P  
The average results of chemical analyses in wt %*

Element	No	CO 2	CO 3	CO 4	CO 5
P		11,60	9,26	5,54	9,45
Fe		0,096	0,11	0,29	0,11
Pb		0,070	0,10	0,29	0,0044
Sn		0,35	0,037	0,13	0,55
Sb		0,065	0,14	0,092	0,034
Bi		0,0049	0,015	0,0086	0,00095
Ni		0,013	0,10	0,25	0,0082
Zn		0,15	0,24	0,029	0,061
As		0,0050	0,011	0,016	0,0023
Se		(0,0045)	(0,0073)	(0,010)	(0,0015)
Te		(0,0055)	(0,0080)	(0,012)	(0,0023)
Cu		the rest	the rest	the rest	the rest

Director of the Institute

Prof. Ph.D. Zbigniew Śmieszek

*Confidence intervals in wt % at the probability level of 0,05*

Element No	CO 2	CO 3	CO 4	CO 5
P	0,040	0,050	0,049	0,091
Fe	0,0043	0,0061	0,0060	0,0053
Pb	0,0029	0,0026	0,018	0,00037
Sn	0,0096	0,0033	0,0092	0,013
Sb	0,0040	0,0098	0,0043	0,0012
Bi	0,00031	0,00060	0,00041	0,000092
Ni	0,00065	0,0046	0,012	0,00046
Zn	0,0065	0,0065	0,0017	0,0023
As	0,00030	0,0018	0,0023	0,00018
Se	---	---	---	---
Te	---	---	---	---

*Analytical methods applied:*

*P - titration, gravimetric, spectrophotometric*

*Zn - atomic absorption*

*Ni - atomic absorption*

*Fe - atomic absorption*

*Pb - atomic absorption*

*Sn - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*Sb - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*Bi - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*As - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*Se - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*Te - atomic absorption after electrolysis and coprecipitation on Fe(OH)<sub>3</sub> at pH 4*

*The chemical analyses have been carried out in three industrial laboratories and at the Institute of Non-Ferrous Metals. The preliminary alloy Cu-P SRM was made by melting of all components in the coreless induction furnace and by casting into special cast iron moulds preventing elimination of segregation of the components during solidification. The set consists of 4 standard reference materials in form of discs 40 mm in diameter and 2,5 mm in height.*