ADDENDUM TO THE REPORT
MERCURY EMISSION SOURCES IN RUSSIA
The situation survey in six cities of the country
June 2010

Introduction

In this paper the estimation of the amount of mercury released from Copper and Zinc processing in Russia is presented using the published emission factors[1].

Calculations of mercury emissions from **"Karabashmed" Co. and Kyshtymskiy copper electrolysis plant** were done by multiplying 2000. 2001 and 2002 primary production numbers obtained from the Mineral resources of the World [2] by the following emissions factor: 5.6 g Hg/metric ton Cu for industrial countries[3]

Calculations of mercury emissions from **Chelyabinskiy zinc plant** were done by multiplying 2008 and 2009 primary production numbers obtained from the administration of the facility (http://zinc.ru/_pressFiles/271.pdf) by the following emissions factor: 7.6 g Hg/metric ton Zn for industrial countries[4]

Analysis

"Karabashmed" Co. (Karabash, Chelyabinskaya oblast)
Copper production in 2000 - 2001 (thousand tons)

Industrial facility	**Copper**	**2000**	**2001**	**2002**
"Karabashmed" Co.	Blister copper	36.4	41.7	42.4

In 2001, "Karabashmed" Co. produced more than 134 thousand tons of copper concentrate.

Emissions factor: 5.6 g Hg/metric ton Cu for industrial countries (cite Pacyna, E.G., and J.M. Pacyna, Global Emission of Mercury from Anthropogenic Sources in 1995, Water, Air, and Soil Pollution 137: 149–165, 2002).

Mercury emission in 2000:
36400 Tons = 33090,91 Metric Tons
33090,91 Metric Tons x 0.0000056 metric tons Hg/ metric ton Cu = 0.1853091 **Hg emissions** (metric tons) = 185309.1 **Hg emissions** (g)

[1] Pacyna, E.G., and J.M. Pacyna, Global Emission of Mercury from Anthropogenic Sources in 1995, Water, Air, and Soil Pollution 137: 149–165, 2002
[2] Metal Supply and Sales, 2001, # 12.; Mineral Resources of the World at 1.1 2001 (a statistical reference book, official publication). - M.: FGUNPP .Aerogeologia, 2002. - 475 p. ; Non-ferrous Metallurgy, 2002, # 6; (Rus.)

[3] Pacyna, E.G., and J.M. Pacyna, Global Emission of Mercury from Anthropogenic Sources in 1995, Water, Air, and Soil Pollution 137: 149–165, 2002
[4] *Id.*

Mercury emission in 2001:
41700 Tons = 37909 Metric Tons
37909 Metric Tons x 0.0000056 metric tons Hg/ metric ton Cu= 0.2122909 **Hg emissions** (metric tons) - 212,2909 **Hg emissions** (g)

Mercury emission in 2002:
42400 Tons = 38 545 Metric Tons
38 545 Metric Tons x 0.0000056 metric tons Hg/ metric ton Cu = 0. 215854,5 **Hg emissions** (metric tons) = 215854,5 **Hg emissions** (g)

Kyshtymskiy copper electrolysis plant (Kyshtym, Chelyabinskaya oblast)
Copper production in 2000 - 2001, thousand tons

Industrial facility	**Copper grade**	**2000**	**2001**	**2002**
"Kyshtymskiy Copper Electrolysis Plant" Co.	Refined copper	77.7	82.1	76.3

In 2001, "Kyshtymskiy Copper Electrolysis Plant" Co. produced more than 124 thousand tons of copper concentrate.

Emissions factor : 5.6 g Hg/metric ton Cu for industrial countries

Mercury emission in 2000:
77700 Tons = 70636,36 Metric Tons
70636,36 Metric Tons x 0.0000056 = 0,395564 **Hg emissions** (metric tons) = 395563,6 **Hg emissions** (g)

Mercury emission in 2001:
82100 Tons = 74636 Metric Tons
74636 Metric Tons x 0.0000056=0,417964 **Hg emissions** (metric tons) = 417964 **Hg emissions** (g)

Mercury emission in 2002:
76300 Tons=69363 Metric Tons
69363 Metric Tons x 0.0000056 = 0,388436**Hg emissions** (metric tons) = 388436,4 **Hg emissions (**g)

Copper				
copper emission factor	g Hg/MT Cu	5,6		
Factory emissions	year	2000	2001	2002
Karabashmed	thousand tons Cu	36,4	41,7	42,4

	tons Cu	36400		41700	42400
	MT Cu		33090,91	37909,09	38545,45
	g Hg		185309,1	212290,9	215854,5
	T Hg		0,185309.1	0.212,2909	0.215,8545
Kyshtymskiy	thousand tons Cu	77,7		82,1	76,3
	tons Cu	77700		82100	76300
	MT Cu		70636,36	74636,36	69363,64
	g Hg		395563,6	417963,6	388436,4
	T Hg		0,395564	0,417964	0,388436

Chelyabinskiy zinc plant (Chelyabinsk)
According to data of April 29, 2010, in 2009, Chelyabinskiy zinc plant produced 119.9 thousand tons of Special High Grade zinc and alloys or by 20% less comparatively to 2008 (150 thousand tons).

Emissions factor: 7.6 g Hg /MT Zn for industrial countries

Mercury emission in 2009:
119900 Tons = 109000 Metric Tons
109000 Metric Tons x 0.0000076 = 0.8284 **Hg emissions** (metric tons) = 828400 **Hg emissions (**g)

Zinc			
Zinc emissions factor	g Hg /MT Zn	7.6	
Factory emissions	year	2008	2009
Chelyabinskiy	thousand tons Zn	150	119.9
	tons ZN	150000	119900
	MT Zn	136363.6	109000
	g Hg	1036363.36	828400
	T Hg	1.03636336	0.8284

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