



Supplement of

Evaluating the effects of China's pollution control on inter-annual trends and uncertainties of atmospheric mercury emissions

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Table S1. Database of Hg release ratios by combustion type.

Combustion Type	Release Ratios (%)	References
PC	99.6	Zhou et al. (2008)
	98.2 98.2 98.1 98.1	Luo (2009)
	99.6 100 92.5	X Yang et al. (2007)
	99.1 99.8 99.9	Zhu et al. (2001)
	99.5 99.8	Wang et al. (2008a)
	95.9 94.2 96.3 98.4 99.7 99.8	Chen et al. (2006)
	99.96 99.04 99.98 99.93 100	Wang et al. (2010a)
	95.4 99.9	Wang et al. (2008b)
	99.92 99.91	Xu et al. (2010)
99.99 100 99.96 97.5	Wang et al. (2011)	
Grate	93.75	Wang et al. (2003)
	98	Streets et al. (2005)
CFB	96	L Yang et al. (2007)
	100	Wang et al. (2010a)
	99	Tian et al. (2012)

Table S2. Database of Hg removal efficiencies by air pollutant control device (APCD).

Control Device	Removal Efficiencies (%)	References
ESP ^a	10.78 1.62	Wang et al. (2008b)
	13.5	Zhou et al. (2008)
	24.4 36.16 43.33 15.41	Luo (2009)
	38.7	Wang et al. (2008c)
	0.4 32.78 23.46	L Yang et al. (2007)
	10.8 4.7 33.1	Xu et al. (2010)
	31.1 31.2 24.5	Zhu et al. (2001)
	6.0 20.0 4.0	Wang et al. (2008a)
	24.8	Duan et al. (2005)
	35.7	X Yang et al. (2007)
	2.17 8.75 23.4	Wang et al. (2011)
	36.5 46.4 10.3 6.1 23.8	Wang et al. (2010a)
	25.2	Li (2011)
	2.61 5.83 7.91 15.1	C Wu et al. (2010)
23.1 23.8 29.4 17.8 30.3 32.2	Chen et al. (2006)	
12.8 17.4	Li et al. (2013)	
29.4	Shi et al. (2013)	
ESP ^b	50.6	L Yang et al. (2007)
	59.6	Gao et al. (2007)
	18.5	Wang et al. (2010a)
ESP+FGD	67.8 70.0 81.36 27.5 35.5	Wang et al. (2010a)
	20.9 33.9 69.4 70.6 62.1 74.2	Hu (2009)
	19.1 2.1	Wang et al. (2008c)
	9.6	L Yang et al. (2007)
	73.5 84.9 54.4	Xu et al. (2010)
	62.3 4.4 95.9 44.6	Wang et al. (2011)
	67.3 78.3	Li (2011)
	62.2 55.3 69.5 65.2	C Wu et al. (2010)
	68.7	Shi et al. (2013)
25.4 38.4	Li et al. (2013)	

Table S2 (continued)

Control Device	Removal Efficiencies (%)	References
FF	75.8	L Yang et al. (2007)
	84.0 20.7	Zhang et al. (2008)
	76.9 23.0	Wang et al. (2008a)
WET	8.7	Kilgroe et al. (2001)
	4.3	Chu and Porcella (1995)
	26	Afonso and Senior (2001)
CYC	0.1	Kilgroe et al. (2002)
	12	Huang et al. (2004)
	0	US EPA (1997)
SCR+FGD / SCR+ESP+FGD	82.2	Li (2011)
	36.5	Wang et al. (2010a)
	85	Wang et al. (2010b)
	82.2	Zhi et al. (2013)
	95	Cheng et al. (2009)
	74.1	Chen et al. (2008)
	81	Unpublished data from Jiangsu Environmental Monitoring Center

^a ESP applied with PC (pulverized combustion); ^b ESP applied with CFB (circulating fluidized bed).

Table S3. Database of Hg emission factors of non-ferrous smelting by technology.

Metal	Smelting Process	Mercury emission factor (g/t)			
		Li et al. (2010)	Wang et al. (2010c)	Zhang et al. (2012)	Wu et al. (2012)
Zn	EP	5.70	0.50	0.57	0.59
	ISP	122.00		2.98	6.02
	RZSP	34.00			6.16
	EZF				13.80
	AZ	75.00			45.75
Pb	RPSP			1.00	1.19
	ISP				6.07
	SMP			0.49	10.16
	SPP				29.35
Cu	FFSP			0.23	0.26
	RPSP			0.09	0.28
	RLEP				0.38
	IFSP				1.07
	EF				14.96

Table S4. Database of mass fractions of Hg speciation by source.

Source category	Mercury speciation (%) (Hg ²⁺ Hg ^p Hg ⁰)	References	
Coal combustion	ESP	(11.4 0.0 88.6) (17.1 0.0 82.9)	Wang et al. (2008b)
		(53.5 0.1 46.4)	Zhou et al. (2008)
		(39.5 0.1 60.4)	Wang et al. (2008c)
		(11.4 0.0 88.6) (45.8 0.0 54.2) (8.1 0.0 91.9)	L Yang et al. (2007)
		(30.5 0.9 68.6) (30.2 0.0 69.8) (66.1 2.4 31.5)	Xu et al. (2010)
		(8.1 0.0 91.9) (44.7 0.0 55.3) (17.1 0.0 82.9)	Wang et al. (2008a)
		(74.0 0.0 26.0)	Duan et al. (2005)
		(7.5 0.0 92.5)	X Yang et al. (2007)
		(67.5 0.1 32.4) (49.4 0.0 50.6) (64.0 0.0 36.0)	Wang et al. (2010a)
		(14.3 0.7 85.0) (30.6 0.0 69.4)	
Coal combustion	ESP+FGD	(24.8 0.0 75.2) (18.3 0.0 81.7) (8.9 0.0 91.1)	Wang et al. (2010a)
		(6.2 0.0 93.8) (11.5 0.0 88.5)	Wang et al. (2008b)
		(5.4 0.0 94.6) (3.9 0 96.1)	
		(4.0 0.0 96.0)	
	FF	(27.7 0.6 71.7) (14.9 0.0 85.1) (53.7 2.5 43.8)	Xu et al. (2010)
		(65.4 24.5 10.1)	Zhang et al. (2008)
	SCR+ESP / SCR+ESP+FGD	(74.5 8.8 16.7) (75.6 0.0 24.4)	Wang et al. (2008a)
		(78 10 12)	L Yang et al. (2007)
		(10.7 0.0 89.5)	Wang et al. (2010a)
	CYC/WET	(20.9 0.0 79.1) (15.6 0.0 84.4)	Zhong et al. (2010)
(16.6 0.0 83.4) (17.7 0.0 82.3)		Chen et al. (2008)	
Non-ferrous metal smelting	Zinc	(84.1 0.0 15.9)	Chen et al. (2008)
		(78.0 2.0 20.0)	Streets et al. (2005)
		(36.0 25.0 39.0)	Y Wu et al. (2010)
	Pb	(90.0 4.0 6.0)	Wang et al. (2010c)
		(58.0 0.0 42.0) (61.0 0.0 39.0)	Zhang et al. (2012)
		(70.0 1.0 19.0)	Wu et al. (2012)
Cu	(39.0 0.0 61.0) (40.0 0.0 60.0)	Zhang et al. (2012)	
	(32.0 0.0 68.0) (68.0 0.0 32.0)	Zhang et al. (2012)	
Solid wastes burning	(95.5 0.4 4.1) (63.8 2.6 33.6) (57.7 1.3 41.0) (69.9 4.0 26.1) (98.2 0.8 1.0) (94.9 0.4 4.7) (98.4 0.2 1.4) (88.3 0.1 11.6) (97.3 0.4 2.3) (95.8 0.2 4.0)	Chen et al. (2013)	
Biomass burning	(13 40 47) (5 3 92) (0 34 66) (1 1 98) (0 1 99) (4 11 85) (15 21 64) (0 0 100) (10 14 76) (1 11 88) (7 6 87) (3 12 85) (12 4 84) (3 11 86) (10 25 65) (5 27 68) (9 37 54) (10 15 75) (0 46 54) (14 15 71) (10 11 79) (0 25 75) (1 28 71) (3 32 65) (0 28 72)	Zhang et al. (2013)	

Table S5. National annual emissions of Hg⁰ by source category from 2005 to 2012.

Source category	2005	2006	2007	2008	2009	2010	2011	2012
Coal-fired power plants	85.8	94.3	100.1	98.7	101.5	103.2	115.9	107.7
Industry	255.9	264.9	279.1	282.6	287.8	286.9	285.3	276.0
Cement production	28.2	28.4	28.5	26.2	26.0	21.5	19.2	18.6
Coal use	7.4	7.7	7.8	7.5	7.8	7.5	7.4	7.3
Iron & steel plants	11.4	12.7	13.1	13.7	15.1	16.3	17.6	18.1
Heating boilers	5.3	6.0	7.1	7.6	7.7	8.9	9.6	10.2
Other industrial boilers	18.0	19.6	22.3	24.0	24.6	23.8	25.9	25.8
Nonferrous metal smelting	38.9	43.5	50.3	46.4	47.8	48.0	41.4	33.7
Zinc	12.5	14.2	16.9	17.2	18.4	20.9	20.3	19.7
Lead	24.1	27.2	31.7	27.6	27.7	25.3	20.6	13.3
Copper	2.3	2.1	1.7	1.7	1.7	1.7	0.6	0.7
Gold metallurgy	129.3	128.8	128.9	127.8	128.5	125.9	126.9	128.0
Large scale	12.4	11.9	12.0	10.9	11.6	9.0	10.0	11.1
Artisanal and small scale	116.9	116.9	116.9	116.9	116.9	116.9	116.9	116.9
Other miscellaneous processes	24.9	25.9	28.9	36.9	38.0	42.6	44.7	41.5
Mercury mining	13.0	10.8	11.4	19.0	20.3	22.6	22.6	19.2
Battery/fluorescent lamp production	6.0	6.9	7.8	8.7	8.0	8.0	8.0	8.0
PVC production	5.6	7.1	8.6	8.0	8.5	10.8	12.8	13.1
Oil and gas combustion	0.2	1.1	1.1	1.2	1.2	1.2	1.3	1.3
Residential & commercial sector	22.0	21.6	22.2	22.3	23.5	24.1	25.2	26.6
Coal burning	7.5	7.0	6.8	7.7	8.3	8.7	9.1	9.6
Biofuel use/biomass open burning	7.8	7.9	7.4	7.0	7.1	6.2	6.3	6.3
Solid waste incineration	1.3	1.4	1.5	1.5	1.6	1.7	1.7	2.0
Municipal	0.2	0.3	0.4	0.4	0.6	0.7	0.7	1.0
Rural	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0
Oil and gas combustion	5.3	5.2	6.5	6.0	6.5	7.4	8.1	8.7
Total	363.7	380.8	401.4	403.6	412.7	414.2	426.5	410.3
Total coal combustion	135.3	147.3	157.2	159.3	165.0	168.4	185.6	178.7

Table S6. National annual emissions of Hg²⁺ by source category from 2005 to 2012.

Source category	2005	2006	2007	2008	2009	2010	2011	2012
Coal-fired power plants	55.0	52.0	49.4	42.9	37.4	35.3	38.4	34.7
Industry	194.2	207.3	225.3	224.6	231.2	230.3	229.5	224.9
Cement production	31.1	32.1	32.8	28.6	29.1	21.8	19.2	19.6
Coal use	7.7	8.8	9.6	9.3	10.8	11.5	12.6	13.3
Iron & steel plants	10.6	11.7	12.0	12.3	13.5	14.6	15.8	16.1
Heating boilers	10.2	11.5	13.6	14.7	14.8	17.1	18.6	19.7
Other industrial boilers	34.5	37.5	42.8	46.1	47.2	45.9	50.1	49.8
Nonferrous metal smelting	47.7	53.7	62.7	60.5	63.6	68.1	62.3	56.3
Zinc	29.6	33.8	40.2	40.9	43.7	49.8	48.2	47.0
Lead	15.8	17.8	20.7	18.0	18.1	16.5	13.4	8.7
Copper	2.3	2.1	1.7	1.7	1.7	1.7	0.6	0.7
Gold metallurgy	55.4	55.2	55.2	54.8	55.1	53.9	54.4	54.9
Large scale	5.3	5.1	5.1	4.7	5.0	3.8	4.3	4.8
Artisanal and small scale	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1
Other miscellaneous processes	4.8	5.5	6.1	7.6	7.9	8.7	9.2	8.6
Mercury mining	2.4	2.0	2.1	3.6	3.8	4.2	4.2	3.6
Battery/fluorescent lamp production	1.1	1.3	1.5	1.6	1.5	1.5	1.5	1.5
PVC production	1.0	1.3	1.6	1.5	1.6	2.0	2.4	2.5
Oil and gas combustion	0.2	0.8	0.9	0.9	1.0	0.9	1.0	1.0
Residential & commercial sector	21.6	21.6	22.8	23.5	25.2	26.7	28.1	30.8
Coal burning	7.9	7.5	7.3	8.3	8.9	9.4	9.8	10.3
Biofuel use/biomass open burning	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Solid waste incineration	8.9	9.4	9.8	9.9	10.7	11.0	11.4	13.1
Municipal	1.5	2.2	2.7	3.0	3.8	4.4	4.9	6.8
Rural	7.4	7.3	7.1	7.0	6.8	6.7	6.5	6.4
Oil and gas combustion	4.3	4.2	5.2	4.8	5.2	5.9	6.5	7.0
Total	270.8	280.9	297.5	291.0	293.8	292.3	296.0	290.5
Total coal combustion	125.8	129.1	134.7	133.5	132.7	133.9	145.3	143.9

Table S7. National annual emissions of Hg^P by source category from 2005 to 2012.

Source category	2005	2006	2007	2008	2009	2010	2011	2012
Coal-fired power plants	3.9	3.2	3.0	2.6	1.7	1.5	1.6	1.2
Industry	23.2	24.0	25.8	26.9	27.4	25.4	25.8	25.8
Cement production	5.1	5.3	5.4	4.3	4.3	2.4	1.7	1.8
Coal use	1.0	1.2	1.3	1.2	1.4	1.4	1.5	1.6
Iron & steel plants	4.2	3.5	3.1	3.7	3.8	3.8	3.4	3.4
Heating boilers	2.6	2.9	3.4	3.7	3.7	4.1	4.4	4.7
Other industrial boilers	8.8	9.5	10.8	11.5	11.8	10.9	11.9	11.8
Nonferrous metal smelting	0.9	1.0	1.2	1.2	1.3	1.4	1.4	1.4
Zinc	0.9	1.0	1.2	1.2	1.3	1.4	1.4	1.4
Other miscellaneous processes	1.6	1.8	2.0	2.5	2.5	2.8	3.0	2.8
Mercury mining	0.8	0.7	0.7	1.2	1.3	1.4	1.4	1.2
Battery/fluorescent lamp production	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
PVC production	0.3	0.4	0.5	0.5	0.5	0.7	0.8	0.8
Oil and gas combustion	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.3
Residential & commercial sector	17.7	16.6	16.4	17.9	19.1	20.0	20.9	22.0
Coal burning	14.6	13.5	13.1	14.8	15.9	16.8	17.5	18.5
Biofuel use/biomass open burning	2.0	2.0	1.9	1.8	1.8	1.6	1.6	1.6
Solid waste incineration	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Municipal	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Rural	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Oil and gas combustion	1.1	1.0	1.3	1.2	1.3	1.5	1.6	1.7
Total	44.8	43.8	45.2	47.4	48.2	46.8	48.2	48.9
Total coal combustion	35.1	33.8	34.7	37.5	38.2	38.4	40.3	41.1

REFERENCES

- Afonso, R. F., Senior, C. L.: Assessment of mercury emissions from full scale power plants, Proceedings of the EPRI-EPA-DOE-AWMA mega symposium and mercury conference, Chicago, IL, 2001.
- Chen, J., Yuan, D., Li, Q., Zheng, J., Zhu, Y., Hua, X., He, S., Zhou, J.: Effect of flue-gas cleaning devices on mercury emission from coal-fired boiler, Proceedings of the CSEE, 02, 72-76, 2008 (in Chinese).
- Chen, L., Liu, M., Fan, R., Ma, S., Xu, Z., Ren, M., He, Q.: Mercury speciation and emission from municipal solid waste incinerators in the Pearl River Delta, South China. *Sci. Total Environ.*, 447, 396-402, 2013.
- Chen, Y., Chai, F., Xue, Z., Liu, T., Chen, Y., Tian, C.: Study on mercury emission factors for coal-fired power plants, *Research of Environmental Sciences*, 02, 49-52, 2006 (in Chinese).
- Cheng, C., Hack, P., Chu, P., Chang, N., Lin, T.: Partitioning of mercury, arsenic, selenium, boron, and chloride in a full-scale coal combustion process equipped with selective catalytic reduction, electrostatic precipitation, and flue gas desulfurization systems, *Energy Fuels*, 10, 4805-4816, 2009.
- Chu, P., Porcella, D. B.: Mercury stack emissions from US electric utility power plants, *Water Air Soil Pollut.*, 80, 135-144, 1995.
- Duan, Y., Cao, Y., Kellie, S., Liu, K., Riley, J., Pan, W.: In-situ measurement and distribution of flue gas mercury for a utility PC boiler system, *Journal of Southeast University (English Edition)*, 01, 53-57, 2005.
- Gao, H., Wang, X., Zhou, J., Luo, Z.: The influence of ESP on mercury emission from coal-fired power plant, *Boiler Technology*, 05, 63-67, 2007 (in Chinese).
- Hu, Y.: Mercury emission of coal combustion and analysis of mercury removal technology at home and abroad, *Environment Science and Technology*, 03, 69-72, 2011 (in Chinese).
- Huang, X., Li, M., Friedli, H. R. Song, Y., Chang, D., Zhu, L.: Mercury emissions from biomass burning in China, *Environ. Sci. Technol.*, 45, 9442-9448, 2011.
- Huang, Y. J., Jin, B. S., Zhong, Z. P., Xiao, R.: Study on the distribution of trace elements in gasification products, Proceedings of the CSEE, 11, 208-2012, 2004 (in Chinese).
- Kilgroe, J., Sedman, C., Srivastava, R., Ryan, J., Lee, C., Thorneloe, S.: Control of mercury emissions from coal-fired electric utility boilers: interim report including errata dated 3-21-02, EPA-600/R-01-109, 2002.
- Li, G., Feng, X., Li, Z., Qiu, G., Shang, L., Liang, P., Wang, D., Yang, Y.: Mercury emission to atmosphere from primary Zn production in China, *Sci. Total Environ.*, 408, 4607-4612, 2010.
- Li, W.: Characterization of atmospheric mercury emissions from coal-fired power plant and cement plant (Master Thesis), Xi'an University, Chongqing, China, 2011 (in Chinese).
- Li, Z., Duan, Y.: Mercury removal by ESP and WFGD in a 300 MW coal-fired power plant, *Journal of Fuel Chemistry and Technology*, 04, 0491-0498, 2013 (in Chinese).

- Luo, G. Q: Study of species identification and removal of mercury in coal and during coal combustion (Master Thesis), Huazhong University of Science and Technology, Wuhan, China, 2009 (in Chinese).
- Shi, Y., Deng, S., Zhang, F., Deng, Z., Cao, Q., Liu, Y., Shu, X.: Effect of flue gas pollution control devices on mercury emission from coal-fired power plants, *Advanced Materials Research*, 726, 2160-2164, 2013.
- Streets, D. G., Hao, J., Wu, Y. Jiang, J., Chan, M., Tian, H., Feng, X.: Anthropogenic mercury emissions in China, *Atmos. Environ.*, 39, 7789-7806, 2005.
- Tian, H., Wang, Y., Cheng, K., Qu, Y., Hao, J, Xue, Z., Chai, F.: Control strategies of atmospheric mercury emissions from coal-fired power plants in China, *J. Air Waste Manag. Assoc.*, 62, 576-58, 2012.
- U.S. Environmental Protection Agency (USEPA): Mercury study report to congress. EPA-452/R-97-003, Washington DC: USEPA, 1997.
- Wang, J., Wang, W., Xu, W., Wang, X., Zhao, S.: Mercury removals by existing pollutants control devices of four coal-fired power plants in China, *Journal of Environmental Sciences*, 11, 1839-1844, 2011.
- Wang, S. X., Zhang, L., Li, G. H., Wu, Y., Hao, J. M., Pirrone, N., Sprovieri, F., Ancora, M. P.: Mercury emission and speciation of coal-fired power plants in China, *Atmos. Chem. Phys.*, 10, 1183-1192, 2010a.
- Wang, S. X., Zhang, L., Wu, Y., Ancora, M. P., Zhao, Y., Hao, J. M.: Synergistic mercury removal by conventional pollutant control strategies for coal-fired power plants in China, *J. Air Waste Manag. Assoc.*, 6, 722-730, 2010b.
- Wang, S. X., Song, J. X., Li, G. H., Wu, Y., Zhang, L., Wan, Q., Streets, D. G., Chin, C. K., Hao, J. M.: Estimating mercury emissions from a zinc smelter in relation to China's mercury control policies, *Environ. Pollut.*, 158, 3347-3353, 2010c.
- Wang, W., Qin, Y., Song, D.: Study on the mobility and release of trace elements in coal-fired power plant, *Acta Scientiae Circumstantiae*, 06, 748-752, 2003 (in Chinese).
- Wang, Y., Duan, Y., Yang, L., Jiang, Y.: Comparison of mercury removal characteristic between fabric filter and electrostatic precipitators of coal-fired power plants, *Journal of Fuel Chemistry and Technology*, 01, 23-29, 2008a (in Chinese)
- Wang, Y., Duan Y., Yang, L., Meng, S., Wu, C., Wang, Q.: Experimental Study on mercury removal by combined wet flue gas desulphurization with electrostatic precipitator, *Proceedings of the CSEE*, 29, 64-69, 2008b (in Chinese).
- Wang, Y., Duan, Y., Yang, L., Jiang, Y.: Analysis of the factors exercising an influence on the morphological transformation of mercury in the flue gas of a 600MW coal-fired power plant, *Journal of Engineering for Thermal Energy and Power*, 04, 399-403, 2008c (in Chinese)..
- Wu, C., Cao, Y., Dong, Z., Cheng, C., Li, H., Pan, W.: Evaluation of mercury speciation and removal through air pollution control devices of a 190 MW boiler, *Journal of Environmental Sciences*, 02, 277-282, 2010.

- Wu, Q. R., Wang, S. X., Zhang, L., Song, J. X., Yang, H., Meng, Y.: Update of mercury emissions from China's primary zinc, lead and copper smelters, 2000-2010. *Atmos. Chem. Phys.*, 12, 11153-11163, 2012.
- Wu, Y., Streets, D. G., Wang, S. X., Hao, J. M.: Uncertainties in estimating mercury emissions from coal-fired power plants in China, *Atmos. Chem. Phys.*, 10, 2937-2947, 2010.
- Xu, W., Wang, J., Wang, W.: Effect of precipitator and desulphurization devices on the removal of mercury with different speciation in coal-fired flue gas, *East China Electric Power*, 01, 47-50, 2010 (in Chinese).
- Yang, L., Duan, Y., Yang, X., Jiang, Y., Wang, Y., Zhao, C.: Mercury emission characteristic from coal-fired power plants, *Journal of Southeast University (Natural Science Edition)*, 05, 817-821, 2007 (in Chinese).
- Yang, X., Duan, Y., Jiang, Y., Yang, L.: Research on mercury form distribution in flue gas and fly ash of coal-fired boiler, *Coal Science and Technology*, 12, 55-58, 2007 (in Chinese).
- Zhang, L.: Research on mercury emission measurement and estimate from combustion resources (Master Thesis), Zhejiang University, Hangzhou, China, 2007 (in Chinese).
- Zhang, L., Wang, S., Wu, Q., Meng, Y., Yang, H., Wang, F., Hao, J.: Were mercury emission factors for Chinese non-ferrous metal smelters overestimated? Evidence from onsite measurements in six smelters, *Environ. Pollut.*, 171, 109-117, 2012.
- Zhang, L., Zhuo, Y., Chen, L., Xu, X., Chen, C.: Mercury emissions from six coal-fired power plants in China, *Fuel Processing Technology*, 11, 1033-1040, 2008.
- Zhang, W., Wei, W., Hu, D., Zhu, Y., Wang, X.: Emission of speciated mercury from residential biomass fuel combustion in China, *Energy Fuels*, 27, 6792-6800, 2013.
- Zhi, G., Xue, Z., Li, Y., Ma, J., Liu, Y., Meng, F., Chai, F.: Uncertainty of flue gas mercury emissions from coal-fired power plants in China based on field measurements, *Research of Environmental Sciences*, 26, 814-821, 2013 (in Chinese).
- Zhong, L., Cao, Y., Li, W., Pan, W., Xie, K.: Effect of the existing air pollutant control devices on mercury emission in coal-fired power plants, *Journal of Fuel Chemistry and Technology*, 6, 641-646, 2010 (in Chinese).
- Zhou, J., Zhang, L., Luo, Z., Hu, C., He, S., Zheng, J., Cen, K.: Research progress of removing mercury from coal-fired flue gas, *Chemical Industry and Engineering Progress*, 04, 22-27, 2008 (in Chinese).
- Zhu, J., Tan, Y., Zheng, J., Zhang, C., Li, Y., Zhang, D., Wang, C.: Study on characteristic of mercury distribution in combustion products at various loads of a P.C.-fired utility boiler, *Proceedings of the CSEE*, 07, 87-90, 2001 (in Chinese).