Contents

_	1.1	Mercury Emission Sources	1	
	1.2	Mercury Speciation and Its Transportation	3	
	1.3	The Effect of Mercury on Environment and Human's Health	4	
	Refe	rences	13	
2	The	Status of Mercury Emission from Coal Combustion		
		er Station	19	
	2.1	Flue Gas Mercury Emission and Its Speciation	20	
	2.2	The Status of Mercury Emission in the USA	23	
	2.3	The Status of Mercury Emission in China	24	
	2.4	The Status of Global Mercury Emission	27	
	Refe	rences	29	
3	Coal-Fired-Derived Flue Gas Mercury Measurement			
	3.1	Ontario Hydro Method (OHM)	32	
		3.1.1 Introduction of OHM	32	
		3.1.2 Procedure and QA/QC of OHM	32	
	3.2	Semicontinuous Emission Monitor (SCEM)	34	
		3.2.1 Introduction of SCEM	34	
		3.2.2 Comparison Between Different SCEM Methods	36	
	3.3	Appendix K (Sorbent Trap Method)	43	
	3.4	Comparison Between Different Mercury Emission		
		Measurement Methods	43	
		3.4.1 Comparison Between SCEM and OHM	43	
		3.4.2 Comparison Between OHM, SCEM,		
		and Appendix K	47	
	3.5	The Effects of Mercury Measurements on Mercury Speciation	50	
	Refe	erences	52	

Mercury and Its Effects on Environment and Human's Health

viii Contents

4	The		ce Factors on Mercury Speciation	55		
	4.1	The E	ffect of Halogen on Mercury Speciation	57		
		4.1.1	The Effect of Chlorine and Chloride on Mercury			
			Speciation	58		
		4.1.2	The Effect of Other Halogen on Mercury Speciation	61		
		4.1.3	Addition of Hydrogen Bromide (HBr)	62		
		4.1.4	Addition of Hydrogen Iodine (HI)	63		
		4.1.5	Comparison of Impacts on Hg(0) Oxidation			
			by Different Halogen Additives	64		
	4.2	The E	ffect of SO ₂ , NOx, and Other Constitutes			
		on Mercury Speciation				
		4.2.1	The Effect of SOx on Mercury Speciation	68		
		4.2.2	The Effect of NOx on Mercury Speciation	70		
		4.2.3	The Effect of NO and SO ₂ on Mercury Oxidation by HCl	71		
		4.2.4	The Effect of H ₂ O on Mercury Speciation	72		
		4.2.5	The Effect of Fly Ash on Mercury Speciation	73		
	Refe	erences		74		
5	Coa	l-Fired	Flue-Gas Mercury Control Technologies	77		
	5.1		o-benefit of Existing Air Pollution Control Devices			
	J.1		Ds)	79		
	5.2	nt Development and Its Mercury Emission				
	٥.2	Removal Efficiency				
		5.2.1	Activated Carbon (AC) and Powdered Activated			
		0.2.1	Carbon (PAC)	85		
		5.2.2	Modified Powdered Activated Carbon	88		
		5.2.3	Fly 'Ash	95		
		5.2.4	Novel Sorbent	100		
	5.3		ation of the Effect of Sorbent Injection on Mercury			
			val	11		
	5.4		ives into the Coal Combustion	125		
	5.5					
		5.5.1	Effects of Spiking Gases on Hg Oxidation			
			with or Without the SCR Catalyst	139		
	5.6	The D	Developing Trend of Coal-Fired Flue-Gas Mercury			
			ion Controls	140		
		5.6.1	Fuel/Raw Material Pretreatment	140		
		5.6.2	Existing Air Pollution Control Devices (APCDs)	14		
		5.6.3	Mercury Adsorption	14		
		5.6.4	Mercury Oxidation	149		
	Dof.	erences	•	15		