

Contents

1	Introduction.....	9
2	Pollutants in flue gases and their corrosive effects	12
3	Flue Gas Desulphurisation systems and existing plants.....	13
3.1	Wet processes	13
3.1.1	Lime or limestone/sludge processes	14
3.1.2	Double-alkali processes	21
3.1.3	Gypsum processes	23
3.1.4	Regenerative processes	24
3.2	Dry processes.....	27
3.3	Other scrubbing systems	27
3.3.1	Scrubbing systems in incinerators	27
4	Types of corrosion and test techniques in scrubbing systems	31
4.1	General corrosion and dew point corrosion.....	31
4.2	Pitting corrosion.....	32
4.3	Crevice corrosion.....	32
4.4	Intergranular corrosion.....	33
4.5	Stress-corrosion cracking	35
4.6	Corrosion fatigue	35
4.7	Erosion-corrosion	36
4.8	Galvanic corrosion	36
5	Corrosion control of flue gas desulphurisation systems.....	36
5.1	Prevention of corrosion	37
5.2	Materials performance	38
5.2.1	Carbon steels and low alloy high strength steels.....	38
5.2.2	Stainless steels	39
5.2.3	Nickel alloys.....	41
5.2.4	Titanium alloys	42
5.2.5	Organic and/or inorganic materials	43
6	Selection of materials for the scrubber components	45
6.1	Inlet and by-pass duct.....	45
6.2	Pre-scrubbers	46
6.3	Absorbers.....	48
6.4	Outlet duct	49
6.5	Fans and dampers	51
6.6	Flue gas stack liners.....	51
7	Conclusions.....	52
8	Literature.....	55
	Figures and Tables	64
	Appendices.....	136