Sulphur Production and Incinerator Gas Dilution

Inlet Composition

Flow Rate	=	30.0	MMSCFD	=	30,000,000 SCFD
	=	3,481	lb mols/hr		

	Mol %	Mol /hr
H_2S	10	348
CO_2	4	139
N_2	2	70
CH_4	84	2,924
	100	3,481

Acid Gas to be Incinerated

	Mol /hr	Mol %	
H_2S	348	67	
CO_2	139	27	
N_2	1	0	(Assuming 1% carry-over)
CH_4	29	6	(Assuming 1% carry-over)
	517	100	

Estimated Sulphur Production (Worst Case as Sulphur can exist as S_2, S_6 and S_8)

Tons of S_2 to be Produced	=	5,569	lb /hr
	=	2,526	kg/hr
	=	60,626	kg/day
	=	61	ton/day

Combustion Reactions

$H_2S + 3/2\ O_2$ -> $H_2O + SO_2$

$CH_4 + 2\ O_2$ -> $CO2 + 2\ H_2O$

Oxygen Required

	Mol /hr
H_2S	522
CO_2	-
N_2	-
CH_4	58
	581

Accompanying N_2	=	2,184	Mol /hr
Air Required	**=**	**2,765**	**Mol /hr**
		23,828,571	**SCFD**

Flare Gas Composition

	Mol /hr	Mol %
SO_2	348	11
CO_2	168	5
N_2	2,184	70
H_2O	407	13
	3,107	100

Excess Air	=	500	% Excess
	=	13,823	Mol /hr
	=	119,142,857	SCFD

	Mol /hr	Mol %
SO_2	348	2.056
CO_2	168	1.00
N_2	13,104	77.40
H_2O	407	2.40
O_2	2,903	17.15
	16,930	100

SO_2 Emission	=	20,559	PPM
	=	1,662	ug $S0_2$ / m^3 Exhaust Gas
	=	58,739	mg /Nm^3

SO_2 Emission Standards

USA	0.025% Vol SO2 with 0% Vol Excess Air
Japan	8 - 190 PPM
Europe	200 mg/Nm3