School of Industrial Engineering

Politecnico di Milano, Campus Piacenza

Exercises of "Fundamentals of Chemical Processes for Energy and Environment"

Exercise 1

Part 1 - Results

	PM [g/mol]	x [-]	w [-]
CH_4	16.00	0.30	0.1395
C_3H_6	42.00	0.20	0.2442
CO	28.00	0.10	0.0814
CH_3CH_2OH	46.00	0.40	0.5349
Mix	34.40	1.00	1.0000

Part 2 – Results

	PM [g/mol]	w [-]	x [-]
NH_3	17.00	0.20	0.2083
H_2	2.00	0.05	0.4426
H_2S	34.00	0.40	0.2083
N_2O	44.00	0.35	0.1408
Mix	17.70	1.00	1.0000

Exercise 2

Waste	259.7	kg
Sulfuric Acid	156.7	kg
Nitric Acid	83.6	kg

Exercise 3

Stream	Flow [kg/h]	w_A [-]
1	60	0.233
2	90	0.255
3	60	0.083

Exercise 4

Assuming 100 mol/t.u. of Dry Air as basis

Stream	Air [mol/u.t.]	H_2O [mol/u.t.]
1	100.00	4.167
2	390.08	9.183
3	-	2.437
4	390.08	6.746
5	290.08	5.017

Assuming 100 mol/t.u. of total outlet stream as basis

Stream	Air [mol/u.t.]	H_2O [mol/u.t.]
1	98.30	4.096
2	383.45	9.027
3	-	2.396
4	383.45	6.631
5	285.15	4.931

Exercise 5

Stream	K_2CrO_4 [kg/h]	H_2O [kg/h]	w_K [-]
1	1498.5	3001.5	0.333
2	3553.8	6592.6	0.350
3	0.0	2952.3	0.000
4	3553.8	3640.3	0.494
5	28.2	49.2	0.364
6	2055.3	3591.1	0.364
cake	1470.3	-	100.0