

LAMPIRAN

1. Perhitungan Reaktor

Komponen-komponen dalam tangki pencampur terdiri dari H₂O, H₂SO₄, maka perhitungan neraca massanya adalah sebagai berikut:

$$\text{H}_2\text{O} = 18,01528 \text{ g/mol}$$

$$\text{H}_2\text{SO}_4 = 98,079 \text{ g/mol}$$

Basis ; 100 kg NaNO₃

$$\text{Kadar NaNO}_3 = 98 \%$$

$$\text{H}_2\text{O} = 2 \text{ kg}$$

$$\text{NaNO}_3 \text{ masuk} = 100 \text{ kg} = 1,176470588 \text{ kmol}$$

Konversi 0,97

$$\begin{aligned} \text{NaNO}_3 \text{ reaksi} &= 1,176470588 \times 0,97 \\ &= 1,141176471 \text{ kmol} \end{aligned}$$

$$\begin{aligned} \text{NaNO}_3 \text{ sisa} &= 1,176470588 - 1,141176471 \\ &= 0,035294118 \text{ kmol} \\ &= 3 \text{ kg} \end{aligned}$$



H₂SO₄ yang diumpankan ekimolar

$$\begin{aligned} \text{H}_2\text{SO}_4 \text{ masuk} &= 1,176470588 \text{ kmol} \\ &= 115,2941176 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{H}_2\text{SO}_4 \text{ reaksi} &= 1,141176471 \text{ kmol} \\ &= 111,8352941 \text{ kg} \end{aligned}$$

$$\text{H}_2\text{SO}_4 \text{ sisa} = 3,458823529 \text{ kg}$$

$$\text{Kadar H}_2\text{SO}_4 = 93\%$$

$$\text{H}_2\text{O dlm H}_2\text{SO}_4 = (7/100) \times 115,2941176 \text{ kg} = 8,070588235 \text{ kg}$$

$$\begin{aligned} \text{NaHSO}_4 \text{ hasil} &= 1,141176471 \text{ kmol} \\ &= 136,9297647 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{HNO}_3 \text{ hasil} &= 1,141176471 \text{ kmol} \\ &= 71,89411765 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{H}_2\text{O total dalam reaktor} &= \text{H}_2\text{O dlm NaNO}_3 + \text{H}_2\text{O dlm H}_2\text{SO}_4 \\ &= 2 + 8,070588235 \end{aligned}$$

$$= 10,07058824 \text{ kg}$$

Asumsi: H₂O dalam Either Cake = 10 %

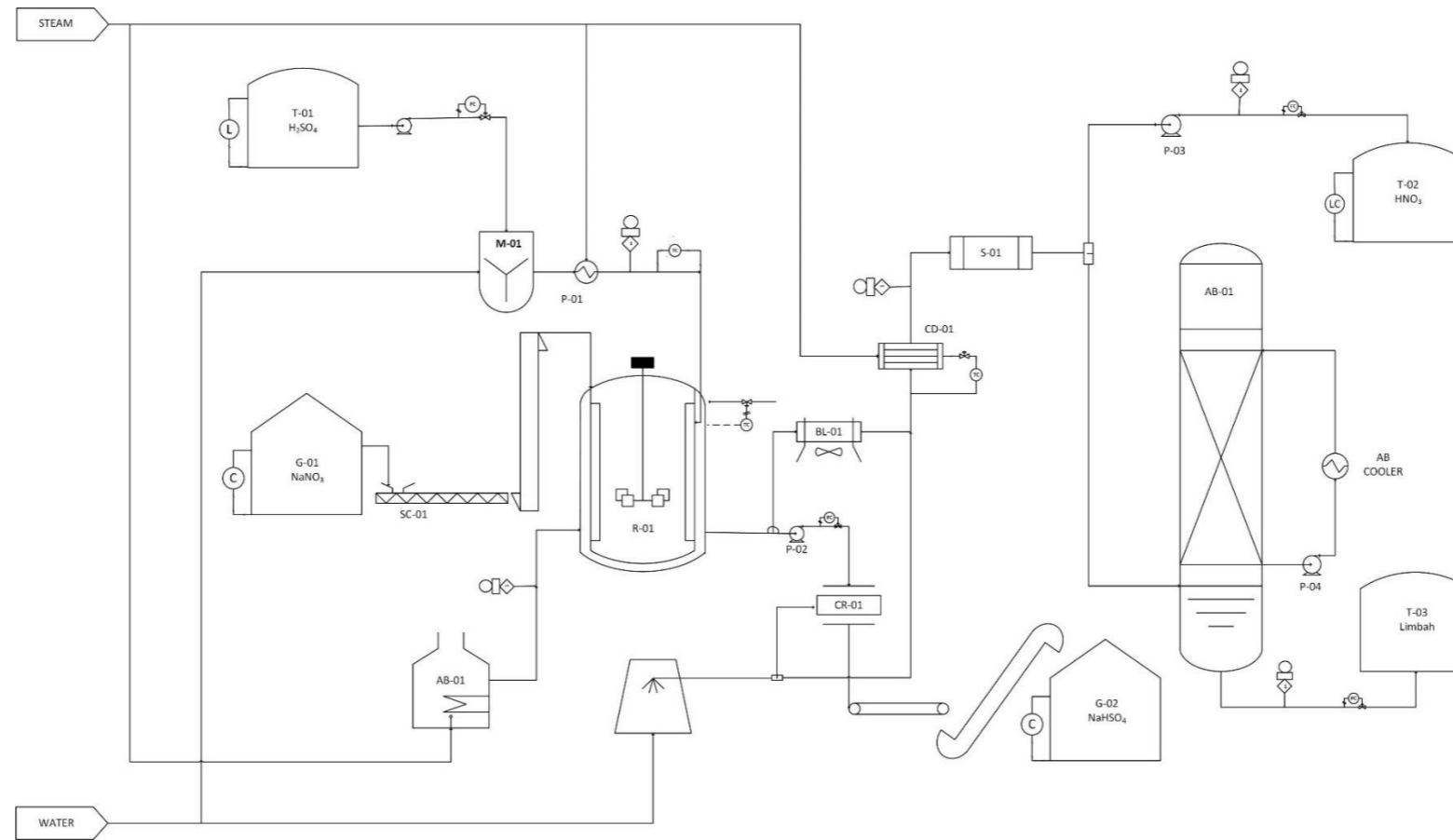
$$= 10/100 \times 10,07058824 \text{ kg}$$

$$= 1,007058824 \text{ kg}$$

H₂O keluar reaktor = 10,07058824 kg - 1,007058824 kg

$$= 9,063529412 \text{ kg}$$

PROSES ENGINEERING FLOW DIAGRAM
PRA RANCANGAN PABRIK ASAM NITRAT DARI NATRIUM NITRAT DAN ASAM SULFAT
KAPASITAS 7000 TON/TAHUN



Komponen	Arus 1	Arus 2	Arus 3	Arus 4
NaNO ₃	934,8126101			
H ₂ SO ₄	1077,78395			
H ₂ O	94,1411474	84,7270158	84,727033	5,985606
HNO ₃		672,075277	672,075413	324,969908
NO ₂				8,534294
O ₂				49,072173

KODE	KETERANGAN
G-01	Gudang natrium nitrat
G-02	Gudang natrium bisulfat
T-01	Tanki asam sulfat
T-02	Tanki asam nitrat
T-03	Tanki limbah
R-01	Reaktor
CD-01	Condensor
S-01	Separator
AB-01	Absorber
M-01	Mixer
P	Pompa
He-01	Heat exchanger
B-01	Boiler
BL-01	Blower

SIMBOL	KETERANGAN
	Flow controller
	Temperature controller
	Level controller
	Stream ID
	Temperature °C
	Control valve
	Electric connection
	Piping

	JURUSAN TEKNIK KIMIA FAKULTAS TEKNOLOGI INDUSTRI UNIVERSITAS NAHDLATUL ULAMA AL GHAZALI CILACAP
	PROSES ENGINEERING FLOW DIAGRAM PABRIK ASAM NITRAT DARI NATRIUM NITRAT DAN ASAM SULFAT KAPASITAS 7000 TON PER TAHUN
Dikerjakan oleh: AHMAD SULAIMAN (18242011002)	
Dosen pembimbing: 1. Siti khuzaimah S.T., M.Pd 2. Norma eralita M.Pd	