

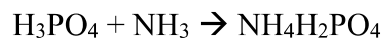
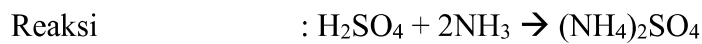
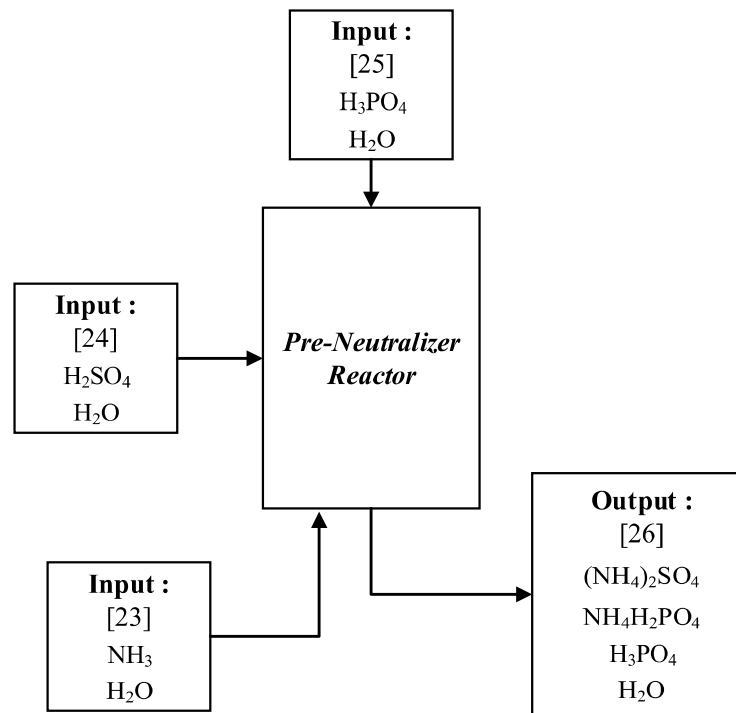


APPENDIX

Tabel 1. Berat Molekul Komponen

Komponen	BM
NH <sub>3</sub>	17
H <sub>2</sub> SO <sub>4</sub>	98
H <sub>3</sub> PO <sub>4</sub>	98
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	132
NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	115
(NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub>	132
H <sub>2</sub> O	17

1. Fungsi Preneutralizer : Pembuatan larutan slurry



Konversi reaksi : 21,74%

Neraca massa total :

$$I23+I24+I25=O26$$



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Neraca massa komponen :

a.  $\text{NH}_3$

$$\text{NH}_3 \text{ masuk} = 44944,5653 \text{ kg}$$

$$\begin{aligned}\text{NH}_3 \text{ murni} &= \text{NH}_3 \text{ masuk} \times \text{fraksi} \\ &= (44944,5653 \text{ kg}) \times (0,995) \\ &= 44719,8424 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{H}_2\text{O} &= \text{NH}_3 \text{ masuk} - \text{NH}_3 \text{ murni} \\ &= 44944,5653 \text{ kg} - 44719,8424 \text{ kg} \\ &= 224,7228 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{Mol NH}_3 \text{ mula-mula} &= \frac{\text{NH}_3 \text{ murni}}{\text{BM NH}_3} \\ &= \frac{44719,8424 \text{ kg}}{17 \frac{\text{kg}}{\text{mol}}} \\ &= 2630,5790 \text{ mol}\end{aligned}$$

b.  $\text{H}_2\text{SO}_4$

$$\text{H}_2\text{SO}_4 \text{ masuk} = 76203,8432 \text{ kg}$$

$$\begin{aligned}\text{H}_2\text{SO}_4 \text{ murni} &= \text{H}_2\text{SO}_4 \text{ masuk} \times \text{fraksi} \\ &= (76203,8432 \text{ kg}) \times (0,98) \\ &= 74679,7663 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{H}_2\text{O} &= \text{H}_2\text{SO}_4 \text{ masuk} - \text{H}_2\text{SO}_4 \text{ murni} \\ &= 76203,8432 \text{ kg} - 74679,7663 \text{ kg} \\ &= 1524,0769 \text{ kg}\end{aligned}$$

$$\begin{aligned}\text{Mol H}_2\text{SO}_4 \text{ mula-mula} &= \frac{\text{H}_2\text{SO}_4 \text{ murni}}{\text{BM H}_2\text{SO}_4} \\ &= \frac{74679,7663 \text{ kg}}{96 \frac{\text{kg}}{\text{mol}}} \\ &= 762,0384 \text{ mol}\end{aligned}$$

c.  $\text{H}_3\text{PO}_4$

$$\text{H}_3\text{PO}_4 \text{ masuk} = 298719,0651 \text{ kg/day}$$

$$\text{H}_3\text{PO}_4 \text{ murni} = \text{H}_3\text{PO}_4 \text{ masuk} \times \text{fraksi}$$



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$$\begin{aligned} &= (298719,0651 \text{ kg}) \times (0,5) \\ &= 149359,5326 \text{ kg} \\ \text{H}_2\text{O} &= \text{H}_3\text{PO}_4 \text{ masuk} - \text{H}_3\text{PO}_4 \text{ murni} \\ &= 298719,0651 \text{ kg} - 149359,5326 \text{ kg} \\ &= 149359,5326 \text{ kg} \\ \text{Mol H}_3\text{PO}_4 \text{ mula-mula} &= \frac{\text{H}_3\text{PO}_4 \text{ murni}}{\text{BM H}_3\text{PO}_4} \\ &= \frac{149359,5326 \text{ kg}}{98 \frac{\text{kg}}{\text{mol}}} \\ &= 1524,0769 \text{ mol} \\ \text{d. (NH}_4\text{)}_2\text{SO}_4 &= \text{Mol sisa reaksi} \times \text{BM (NH}_4\text{)}_2\text{SO}_4 \\ &= 762,038432 \text{ mol} \times 132 \text{ kg/mol} \\ &= 100589,0730 \text{ kg} \\ \text{NH}_4\text{H}_2\text{PO}_4 &= \text{Mol sisa reaksi} \times \text{BM NH}_4\text{H}_2\text{PO}_4 \\ &= 1106,5021 \text{ mol} \times 115 \text{ kg/mol} \\ &= 127247,7419 \text{ kg} \\ \text{H}_3\text{PO}_4 &= \text{Mol sisa reaksi} \times \text{BM H}_3\text{PO}_4 \\ &= 417,5748 \text{ mol} \times 98 \text{ kg/mol} \\ &= 40922,3264 \text{ kg} \\ \text{H}_2\text{O} &= \text{H}_2\text{O dari larutan (NH}_3 + \text{H}_2\text{SO}_4 + \text{H}_3\text{PO}_4) \\ \text{masuk reaktor} &= 224,7228\text{kg} + 1524,0769\text{kg} + \\ 149359,5326\text{kg} &= 151108,3322 \text{ kg} \end{aligned}$$



Tabel 2. Neraca Massa pada Reaktor Preneutralizer

INPUT		OUTPUT	
<b>Stream 23</b>		<b>Stream 26</b>	
NH <sub>3</sub>	44719,8424	H <sub>3</sub> PO <sub>4</sub>	40922,3264
H <sub>2</sub> O	<u>224,7228</u>	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	100589,0730
	44944,5653	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	127247,7419
<b>Stream 24</b>		H <sub>2</sub> O	<u>151108,3322</u>
H <sub>2</sub> SO <sub>4</sub>	74679,7663		<b>419867,4735</b>
H <sub>2</sub> O	1524,0769		
	76203,84315		
<b>Stream 25</b>			
H <sub>3</sub> PO <sub>4</sub>	149359,5326		
H <sub>2</sub> O	<u>149359,5326</u>		
	298719,0651		
<b>419867,4735</b>			<b>419867,4735</b>