IEQB TP - Ficha 4
Resolução

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Conteúdo

Questão 8 Refazer

$$\mathbf{CO_2 + 3\,H_2 \longrightarrow CH_3OH + H_2O}$$

- 1 = 1i.1
- 2 = 1i
- 3 = 1o
- 3 = 2i
- 4 = 2o1
- 5 = 2o2
- 6 = 2o2.1
- 7 = 2o2.2
- 7 = 1i.2

K mol/h	1i	1i.1	1o	2i	2o1	2o2	2o2.1	2o2.2	1i.2
CO_2	28		14		-	14	2.9	32	%
H_2	70		28		-	28	5.8	22	
Inertes	2	0.40 %	2		-	2	0.41	3.6	
CH_3OH	-	-	14		14	-	-	-	
H_2O	-	-	14		14	-	-	-	
Total	100	65	72		28	44	9.0	35	

$$\frac{40\,\text{mol}_{\text{H}_2\,1\text{o}}}{100\,\text{mol}_{\text{H}_2\,1\text{i}}}\,70\%\,\text{mol}_{\text{H}_2\,1\text{i}} \cong 28\%\,\text{mol}_{\text{H}_2\,1\text{o}}$$

$$28\%\,\text{mol}_{\text{CO}_2\,1\text{i}} - \frac{1\,\text{mol}_{\text{CO}_2\,1\text{i}}}{3\,\text{mol}_{\text{H}_2\,1\text{i}}}\,\frac{60\,\text{mol}_{\text{H}_2\,1\text{i}}}{100\,\text{mol}_{\text{H}_2\,1\text{i}}}\,70\%\,\text{mol}_{\text{H}_2\,1\text{i}} \cong 14\%\,\text{mol}_{\text{CO}_2\,1\text{o}}$$

$$\frac{60\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}}}{100\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}}}\,\frac{1\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}}}{3\,\text{mol}_{\text{H}_2\,1\text{i}}}\,70\,\text{mol}_{\text{H}_2\,1\text{i}} \cong 14\%\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}}$$

$$\frac{1\,\text{mol}_{\text{H}_2\text{O}\,1\text{o}}}{1\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}}}\,14\,\text{mol}_{\text{CH}_3\text{OH}\,1\text{o}} \cong 14\,\text{mol}_{\text{H}_2\text{O}\,1\text{o}}$$

$M_{\text{Total 1i.2}} + M_{\text{Total 1i.1}} = 100\,\text{mol}_{\text{Total 1i}}$;

$$M_{\text{Total 1i.2}}\,\frac{5\,\text{mol}_{\text{Iner 1i.2}}}{100\,\text{mol}_{\text{Total 1i.2}}} + M_{\text{Total 1i.1}}\,\frac{0.40\,\text{mol}_{\text{Iner 1i.1}}}{100\,\text{mol}_{\text{Total 1i.1}}} = 100\,\frac{2\,\text{mol}_{\text{Iner 1i}}}{100\,\text{mol}_{\text{Total 1i}}} \implies$$

$$\implies M_{\text{Total 1i.2}} = \frac{200 - 100 * 0.40}{4.6} \cong 35\,\text{mol}_{\text{Total 1i.2}};$$

$M_{\text{Total 1i.1}} \cong 100 - 35 = 65\,\text{mol}_{\text{Total 1i.1}}$

$M_{\text{Total 2o2.1}} = M_{\text{Total 2o2}} - M_{\text{Total 2o2.2}} \cong 44 - 35 = 9\,\text{mol}_{\text{Total 2o2.1}}$