

Table III. Simulation results for the main process streams

		Absorber				Stripper		
Stream		1	2	3	4	7	8	9
Feed rate, kmole/h		3110.00	17972.35	1914.68	17916.47	19058.93	1085.98	17972.97
Temperature, K		298	298	298	299	309	309	309
Composition mole-%	Propylene	37.80	0.34	1.90	0.00	6.01	99.62	0.34
	Propane	62.20	0.02	98.10	0.33	0.31	0.38	0.02
	RTIL	0.00	91.81	0.00	92.09	86.57	0.00	91.80
	Ag+	0.00	7.83	0.00	0.88	6.84	0.00	7.23
	Complex	0.00	0.00	0.00	6.70	0.31	0.00	0.00

with slight increase in the absorber height as shown in Fig. 11. The results show that the chemical absorption technique for propane/propylene separation is a promising alternative over the distillation technique, where the distillation tower that make the same separation has about 7.3 m diameter and 87 m height with a special type of trays to minimize pressure drop inside the tower.

V. CONCLUSION

In this work, design of chemical absorption system for the separation of propane/propylene mixture was performed. The system consisted mainly of one packed column absorber and regeneration system, which is composed of a throttling valve and a flash separator. The absorber's optimum operating pressure from selectivity point of view is about 1 bar, where higher pressure values give low propylene selectivity. The absorber operating temperature is 298 K. The operating conditions of the flash separator are 0.05 bar pressure and 309 K temperature. The chemical absorption as a technique for propane/propylene separation proved to be challenging, where it gives the same propylene recovery purity of the distillation case with lower equipment size.

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