

Article

A Novel Process of H₂/CO₂ Membrane Separation of Shifted Syngas Coupled with Gasoil Hydrogenation

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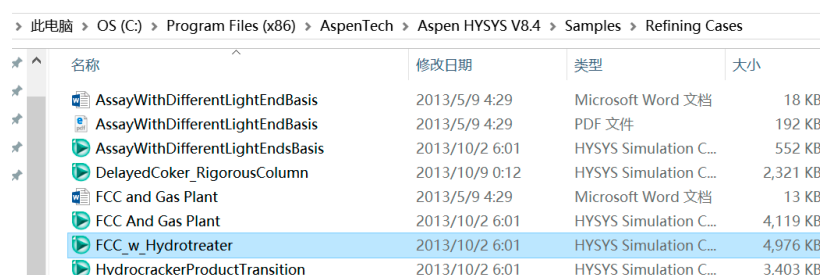
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Figure S1. The file path of the gasoil hydrogenation reaction process we used in this work.

Table S1. The capital cost and operation cost of the CPGH (Conventional PSA Separation for H₂/CO₂ of Shifted Syngas and Gasoil Hydrogenation) process (Excluding reactor part).

Item	Unit	Value
Compressor equipment cost	million \$	21.30
PSA equipment cost	million \$	41.36
Other equipment ¹ cost	million \$	0.80
Total investment cost	million \$	63.46
PSA depreciation cost	million \$/yr	2.36
Other equipment ¹ depreciation	million \$/yr	9.70
Electricity operation cost	million \$/yr	10.66
Cold water operation cost	million \$/yr	3.32
Stream operation cost	million \$/yr	7.12
Total annual cost	million \$/yr	33.16

¹ Other equipment includes heat exchangers, vessels, alkaline washing towers and mixers in process.

Table S2. Operational consumption of the CPGH process (Excluding reactor part).

Item	Number	Unit	Value
Compressor	K-101	kW	9870
	K-102	kW	5763
	K-103	kW	5700
Heat Exchanger	E-101	kW	20,547
	E-102	kW	555
	E-103	kW	6334
	E-104	kW	30,444
	E-105	kW	44,903
PSA		million \$/year	2.36
Depreciation		million \$/year	9.70
Total annual cost		million \$/year	33.16

Table S3. Operational consumption of the NMGH process (Excluding reactor part).

Item	Number	Unit	Value
Compressor	K-101	kW	7200
	K-102	kW	3298
	K-103	kW	11,038
	K-104	kW	14754
Heat Exchanger	E-101	kW	20,547
	E-102	kW	16,127
	E-103	kW	33,527
	E-104	kW	12,872
	E-105	kW	20,844
Depreciation		million \$/year	4.20
Total annual cost		million \$/year	31.66



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