

Modelling and Cost Estimation for Conversion of Green Methanol to Renewable Liquid Transport Fuels via Olefin Oligomerisation

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The Supplementary Materials includes the input specifications and the output values of the Aspen Plus simulation model. The components selected for the system are first shown in Table S1. Next, reactions considered in each reactor are shown in Table S2-Table S5. Equipment operations are specified in Table S6. The results of the model are shown in Table S7 and Table S8 of which the former lists the purchased equipment costs calculated by APEA, and the latter shows the complete stream table.

1. Component specifications

Table S1. Component specifications of the MTO-MOGD model.

| Component ID | Type | Component name | Alias |
|--------------|--------------|----------------------------|----------|
| Methanol | Conventional | METHANOL | CH4O |
| DME | Conventional | DIMETHYL-ETHER | C2H6O-1 |
| Water | Conventional | WATER | H2O |
| Methane | Conventional | METHANE | CH4 |
| Ethane | Conventional | ETHANE | C2H6 |
| Ethylene | Conventional | ETHYLENE | C2H4 |
| Propane | Conventional | PROPANE | C3H8 |
| Propylene | Conventional | PROPYLENE | C3H6-2 |
| n-Butane | Conventional | N-BUTANE | C4H10-1 |
| i-Butane | Conventional | ISOBUTANE | C4H10-2 |
| Butene | Conventional | 1-BUTENE | C4H8-1 |
| n-Pentane | Conventional | N-PENTANE | C5H12-1 |
| i-Pentane | Conventional | 2-METHYL-BUTANE | C5H12-2 |
| Cyclopentane | Conventional | CYCLOPENTANE | C5H10-1 |
| Pentene | Conventional | 1-PENTENE | C5H10-2 |
| n-Hexane | Conventional | N-HEXANE | C6H14-1 |
| i-Hexane | Conventional | 2-METHYL-PENTANE | C6H14-2 |
| Cyclohexane | Conventional | CYCLOHEXANE | C6H12-1 |
| Hexene | Conventional | 1-HEXENE | C6H12-3 |
| n-Octane | Conventional | N-OCTANE | C8H18-1 |
| i-Octane | Conventional | 2,2,4-TRIMETHYLPENTANE | C8H18-13 |
| Octene | Conventional | 1-OCTENE | C8H16-16 |
| Benzene | Conventional | BENZENE | C6H6 |
| Durene | Conventional | 1,2,4,5-TETRAMETHYLBENZENE | C10H14-9 |

| | | | |
|--------------|--------------|-----------------------------|-----------|
| Prehnitene | Conventional | 1,2,3,4-TETRAMETHYL-BENZENE | C10H14-E7 |
| i-Durene | Conventional | 1,2,3,5-TETRAMETHYL-BENZENE | C10H14-E6 |
| n-Dodecane | Conventional | N-DODECANE | C12H26 |
| i-Dodecane | Conventional | 2-METHYLNUNDECANE | C12H26-N9 |
| Dodecene | Conventional | 1-DODECENE | C12H24-2 |
| n-Hexadecane | Conventional | N-HEXADECANE | C16H34 |
| i-Hexadecane | Conventional | 2-METHYLPENTADECANE | C16H34-N1 |
| Hexadecene | Conventional | 1-HEXADECENE | C16H32-2 |
| n-Octadecane | Conventional | N-OCTADECANE | C18H38 |
| i-Octadecane | Conventional | 16-METHYLHEPTADECANE | C18H38-N1 |
| Octadecene | Conventional | 1-OCTADECENE | C18H36-1 |
| n-Eicosane | Conventional | N-EICOSANE | C20H42 |
| i-Eicosane | Conventional | 18-METHYLNONADECAN | C20H42-N3 |
| Eicosene | Conventional | 1-EICOSENE | C20H40-D1 |
| Hydrogen | Conventional | HYDROGEN | H2 |

2. Reaction specifications

Table S2. Reaction specifications of the MTO reactor R-101, and standard reaction enthalpies calculated from literature values [29] and estimated by Aspen Plus.

| Reaction No. | Specification type | Fractional conversion | Fractional conversion of component | Stoichiometry | ΔH_r^0 , kJ/mol | |
|--------------|-----------------------|-----------------------|------------------------------------|---|-------------------------|--------|
| | | | | | Calculated | Aspen |
| 1 | Fractional conversion | 0.99 | Methanol | 2 Methanol --> DME + Water | -15.9 | -23.9 |
| 2 | Fractional conversion | 0.30 | DME | DME --> Ethylene + Water | -5.3 | -5.2 |
| 3 | Fractional conversion | 1 | DME | 3 DME --> 2 Propylene + 3 Water | -132.4 | -132.9 |
| 4 | Fractional conversion | 0.80 | Ethylene | 2 Ethylene --> Butene | -105.6 | -105.6 |
| 5 | Fractional conversion | 0.45 | Propylene | 2 Propylene --> Hexene | -82.8 | -82.3 |
| 6 | Fractional conversion | 0.45 | Ethylene | Ethylene + Propylene --> Pentene | -95.8 | -94.5 |
| 7 | Fractional conversion | 0.50 | Hexene | Hexene --> Benzene + 3 Hydrogen | 124.9 | 124.8 |
| 8 | Fractional conversion | 1 | Methanol | Benzene + 4 Methanol --> Durene + 4 Water | -277.3 | -293.5 |
| 9 | Fractional conversion | 0.15 | Butene | 2 Butene + 2 Hydrogen --> n-Butane + i-Butane | -258.5 | -260.0 |
| 10 | Fractional conversion | 0.075 | Propylene | Propylene + Hydrogen --> Propane | -125.1 | -125.0 |
| 11 | Fractional conversion | 0.15 | Ethylene | Ethylene + Hydrogen --> Ethane | -136.5 | -136.4 |
| 12 | Fractional conversion | 0.50 | Ethylene | Ethylene + 2 Hydrogen --> 2 Methane | -202.2 | -201.6 |
| 13 | Fractional conversion | 1 | Hydrogen | Benzene + 3 Hydrogen --> Cyclohexane | -207.5 | -206.4 |

| | | | | | | |
|----|-----------------------|------|---------|--------------------------|-------|-------|
| 14 | Fractional conversion | 0.50 | Pentene | Pentene --> Cyclopentane | -53.5 | -55.4 |
|----|-----------------------|------|---------|--------------------------|-------|-------|

Table S3. Reaction specifications of the hydroisomerisation reactor R-102.

| Reaction No. | Specification type | Molar extent | Units | Fractional conversion | Fractional conversion of component | Stoichiometry |
|--------------|-----------------------|--------------|--------|-----------------------|------------------------------------|-------------------------------------|
| 1 | Fractional conversion | | | 0.49 | Durene | 2 Durene --> Prehnitene + i-Durene |
| 2 | Molar extent | 0.015 | kmol/h | | | Durene + 5 Hydrogen --> 2 n-Pentane |

Table S4. Reaction specifications of the MOGD reactor R-103, and standard reaction enthalpies calculated from literature values [29, 30] and estimated by Aspen Plus.

| Reaction No. | Specification type | Fractional conversion | Fractional conversion of component | Stoichiometry | ΔH_r^0 , kJ/mol | |
|--------------|-----------------------|-----------------------|------------------------------------|----------------------------------|-------------------------|--------|
| | | | | | Calculated | Aspen |
| 1 | Fractional conversion | 1 | Ethylene | 2 Ethylene --> Butene | -105.6 | -105.6 |
| 2 | Fractional conversion | 1 | Propylene | 2 Propylene --> Hexene | -82.8 | -82.3 |
| 3 | Fractional conversion | 1 | Butene | 2 Butene --> Octene | -81.7 | -81.3 |
| 4 | Fractional conversion | 0.85 | Hexene | 2 Hexene --> Dodecene | -81.4 | -83.3 |
| 5 | Fractional conversion | 0.80 | Octene | 2 Octene --> Hexadecene | -82.5 | -88.7 |
| 6 | Fractional conversion | 0.99 | Hexene | Hexene + Dodecene --> Octadecene | -82.0 | -85.6 |
| 7 | Fractional conversion | 0.99 | Octene | Octene + Dodecene --> Eicosene | -82.4 | -86.2 |

Table S5. Reaction specifications of the hydrogenation reactor R-104.

| Reaction No. | Specification type | Fractional conversion | Fractional conversion of component | Stoichiometry |
|--------------|-----------------------|-----------------------|------------------------------------|---|
| 1 | Fractional conversion | 0.90 | Dodecene | 2 Dodecene + 2 Hydrogen --> n-Dodecane + i-Dodecane |
| 2 | Fractional conversion | 0.90 | Hexadecene | 2 Hexadecene + 2 Hydrogen --> n-Hexadecane + i-Hexadecane |
| 3 | Fractional conversion | 0.90 | Octadecene | 2 Octadecene + 2 Hydrogen --> n-Octadecane + i-Octadecane |
| 4 | Fractional conversion | 0.90 | Eicosene | 2 Eicosene + 2 Hydrogen --> n-Eicosane + i-Eicosane |

3. Equipment specifications

Table S6. Equipment specifications of the MTO-MOGD model. Abbreviations used in the table: I, Isentropic; M, Mechanical; RR, Reflux ratio; and DFR, Distillate to feed ratio.

| Name | Type | Specification | T, °C | P, bar | Duty, kW | No. of stages | Efficiency | Calculation type | Molar RR | Molar DFR | Condenser type | Reboiler type | Pinch, °C | Split fraction | Utility |
|-------|----------|------------------------|-------|--------|----------|---------------|----------------------|------------------|----------|-----------|----------------|---------------|-----------|----------------|---|
| C-101 | Compr | Compressor | | 15 | | 1 | 0.80 (I) 0.90 (M) | Isentropic | | | | | | | Electricity |
| C-102 | MCompr | Multi-stage compressor | | 17 | | 3 | 0.80 (I) 0.90 (M) | Isentropic | | | | | | | Electricity Cooling water |
| C-103 | Compr | Compressor | | 16 | | 1 | 0.80 (I) 0.90 (M) | Isentropic | | | | | | | Electricity |
| C-104 | MCompr | Multi-stage compressor | | 40 | | 4 | 0.80 (I) 0.90 (M) | Isentropic | | | | | | | Electricity Cooling water |
| C-105 | Compr | Compressor | | 40 | | 1 | 0.80 (I) 0.90 (M) | Isentropic | | | | | | | Electricity |
| D-101 | Decanter | Decanter | | 2 | 0 | | | | | | | | | | |
| DIST1 | RadFrac | Distillation column | | 15 | | 4 | | Equilibrium | 1.26 | 0.13 | Partial-Vapor | Kettle | | | Refrigeration |
| DIST2 | RadFrac | Distillation column | | 10 | | 5 | | Equilibrium | 0.012 | 0.99 | Total | Kettle | | | LP steam Cooling water Fired heat |
| DIST3 | RadFrac | Distillation column | | 5 | | 4 | | Equilibrium | 0.26 | 0.45 | Partial-Vapor | Kettle | | | Cooling water HP steam |
| DIST4 | RadFrac | Distillation column | | 1 | | 6 | | Equilibrium | 0.36 | 0.54 | Partial-Vapor | Kettle | | | LP steam generation Fired heat |
| DIST5 | RadFrac | Distillation column | | 5 | | 7 | | Equilibrium | 2.31 | 0.30 | Partial-Vapor | Kettle | | | Refrigeration |

| | | | | | | | |
|-------|--------|----------------|-------------------------------|----|-------------------------|---|---------------------|
| E-101 | HeatX | Heat exchanger | 430 | | Shortcut countercurrent | 5 | LP steam |
| | | | Cold stream outlet | | | | |
| E-102 | Heater | Heater | 450 | 2 | | | Fired heat |
| E-103 | HeatX | Heat exchanger | 40 | | Shortcut countercurrent | 5 | |
| | | | Cold stream outlet | | | | |
| E-104 | Heater | Cooler | 30 | 2 | | | Cooling water |
| E-105 | HeatX | Heat exchanger | 5 | | Shortcut countercurrent | 3 | |
| | | | Hot/cold temperature approach | | | | |
| E-106 | Heater | Cooler | 50 | 15 | | | Cooling water |
| E-107 | HeatX | Heat exchanger | 5 | | Shortcut countercurrent | 3 | |
| | | | Hot/cold temperature approach | | | | |
| E-108 | Heater | Heater | 345 | 17 | | | Fired heat |
| E-109 | Heater | Cooler | 135 | 16 | | | LP steam generation |
| E-110 | Heater | Cooler | 30 | 16 | | | Cooling water |
| E-111 | Heater | Cooler | 10 | 16 | | | Refrigeration |
| E-112 | Heater | Cooler | 30 | 1 | | | Cooling water |
| E-113 | Heater | Heater | 345 | 17 | | | Fired heat |
| E-114 | Heater | Heater | 200 | 40 | | | HP steam |
| E-115 | Heater | Heater | 300 | 40 | | | Fired heat |

| | | | | | | | |
|--------|--------|------------------------|-----|------|---|---------------------|---------------------|
| E-116 | Heater | Cooler | 135 | 0 | | | LP steam generation |
| E-117 | Heater | Cooler | 30 | 0 | | | Cooling water |
| E-118 | Heater | Cooler | 135 | 1 | | | LP steam generation |
| E-119 | Heater | Cooler | 30 | 1 | | | Cooling water |
| E-120 | Heater | Cooler | 30 | 1 | | | Cooling water |
| E-121 | Heater | Cooler | 50 | 5 | | | Cooling water |
| E-122 | Heater | Heater | 300 | 40 | | | Fired heat |
| FLASH1 | Flash2 | Flash column | | 2 | 0 | | |
| FLASH2 | Flash2 | Flash column | | 14.4 | 0 | | |
| FLASH3 | Flash2 | Flash column | | 36 | 0 | | |
| FLASH4 | Flash2 | Flash column | | 1 | 0 | | |
| P-101 | Pump | Pump | | 2 | | | Electricity |
| P-102 | Pump | Pump | | 15 | | | Electricity |
| P-103 | Pump | Pump | | 17 | | | Electricity |
| P-104 | Pump | Pump | | 40 | | | Electricity |
| P-105 | Pump | Pump | | 40 | | | Electricity |
| R-101 | RStoic | Stoichiometric reactor | 450 | 2 | | Vapor-Only | HP steam generation |
| R-102 | RStoic | Stoichiometric reactor | 345 | 16 | | Vapor-Liquid | Fired heat |
| R-103 | RStoic | Stoichiometric reactor | 200 | 39 | | Vapor-Liquid | LP steam generation |
| R-104 | RStoic | Stoichiometric reactor | 300 | 40 | | Vapor-Liquid | HP steam generation |
| V-101 | Mixer | Mixing valve | | 0 | | | |
| V-102 | Mixer | Mixing valve | | 0 | | | |
| V-103 | Valve | Pressure relief valve | | 1 | | Adiabatic flash for | |

| | | | | | | |
|-------|--------|--------------------------|---|--|---|------|
| | | | | | specified outlet pressure | |
| V-104 | FSplit | Split valve | | | | 0.05 |
| V-105 | Mixer | Mixing valve | 0 | | | |
| V-106 | Valve | Pressure relief valve | 5 | | Adiabatic flash for specified outlet pressure | |
| V-107 | Valve | Pressure relief valve | 1 | | Adiabatic flash for specified outlet pressure | |
| V-108 | Mixer | Mixing valve | 0 | | | |

Table S7. Equipment sizes and costs. D refers to a vessel diameter and H to height.

| Equipment | Aspen model | Size | | Number of items | Material factor (f _m) | Equipment cost (APEA), \$ ₂₀₁₈ | Purchased cost, € ₂₀₂₀ |
|-------------------|----------------|-------------------|-------------------|--------------------|--------------------------------------|--|--------------------------------------|
| C-101 | Compr | 49 | kW | 1 | 1 | 782900 | 820730 |
| C-102 | MCompr | 0.33 | kW | 1 | 1.3 | 1237600 | 1297401 |
| C-103 | Compr | 0.03 | kW | 1 | 1.3 | 675200 | 707826 |
| C-104 | MCompr | 15 | kW | 1 | 1.3 | 1498600 | 1571012 |
| C-105 | Compr | 0.17 | kW | 1 | 1.3 | 741400 | 777224 |
| D-101 | Decanter | 1.80 | m ³ | 1 | 1 | 15200 | 15934 |
| DIST1-cond | RadFrac | 3.95 | m ² | 1 | 1 | 10200 | 10693 |
| DIST1-cond acc | | 1.80 | m ³ | 1 | 1 | 14300 | 14991 |
| DIST1-reb | | 0.57 | m ² | 1 | 1 | 13200 | 13838 |
| DIST1-reflux pump | | 0.37 | m ³ /h | 2 | 1 | 9600 | 10064 |
| DIST1-tower | | D=0.46, H=5.49 | m | 1 | 1 | 19400 | 20337 |
| DIST2-cond | RadFrac | 4.39 | m ² | 1 | 1 | 10300 | 10798 |
| DIST2-cond acc | | 1.80 | m ³ | 1 | 1 | 13800 | 14467 |
| DIST2-reb | | 12 | m ² | 1 | 1 | 18400 | 19289 |
| DIST2-reflux pump | | 2.27 | m ³ /h | 2 | 1 | 9600 | 10064 |
| DIST2-tower | | D=0.46, H=6.71 | m | 1 | 1 | 22800 | 23902 |
| DIST3-cond | RadFrac | 0.26 | m ² | 1 | 1 | 8400 | 8806 |
| DIST3-cond acc | | 1.80 | m ³ | 1 | 1 | 13300 | 13943 |
| DIST3-reb | | 1.23 | m ² | 1 | 1 | 13400 | 14047 |
| DIST3-reflux pump | | 0.16 | m ³ /h | 2 | 1 | 9600 | 10064 |
| DIST3-tower | | D=0.46, H=5.49 | m | 1 | 1 | 19300 | 20233 |
| DIST4-cond | RadFrac | 2.48 | m ² | 1 | 1 | 9100 | 9540 |
| DIST4-cond acc | | 1.80 | m ³ | 1 | 1 | 16500 | 17297 |
| DIST4-reb | | 20 | m ² | 1 | 1 | 20000 | 20966 |
| DIST4-reflux pump | | 0.31 | m ³ /h | 2 | 1 | 9600 | 10064 |

| | | | | | | | |
|-------------------|---------|-------------------|-------------------|---|-----|-------|-------|
| DIST4-tower | | D=0.61, H=7.32 | m | 1 | 1 | 36600 | 38369 |
| DIST5-cond | RadFrac | 3.08 | m ² | 1 | 1 | 9200 | 9645 |
| DIST5-cond acc | | 1.80 | m ³ | 1 | 1 | 13300 | 13943 |
| DIST5-reb | | 0.68 | m ² | 1 | 1 | 13200 | 13838 |
| DIST5-reflux pump | | 0.30 | m ³ /h | 2 | 1 | 9600 | 10064 |
| DIST5-tower | | D=0.46, H=8.53 | m | 1 | 1 | 27300 | 28619 |
| E-101 | HeatX | 69 | m ² | 1 | 1.3 | 21700 | 22749 |
| E-102 | Heater | 16 | m ² | 1 | 1.3 | 14400 | 15096 |
| E-103 | HeatX | 0.52 | m ² | 1 | 1 | 8400 | 8806 |
| E-104 | Heater | 13 | m ² | 1 | 1 | 11200 | 11741 |
| E-105 | HeatX | 1.23 | m ² | 1 | 1 | 9100 | 9540 |
| E-106 | Heater | 3.06 | m ² | 1 | 1 | 9200 | 9645 |
| E-107 | HeatX | 0.49 | m ² | 1 | 1.3 | 8500 | 8911 |
| E-108 | Heater | 0.49 | m ² | 1 | 1.3 | 8900 | 9330 |
| E-109 | Heater | 1.06 | m ² | 1 | 1.3 | 9100 | 9540 |
| E-110 | Heater | 0.49 | m ² | 1 | 1.3 | 8400 | 8806 |
| E-111 | Heater | 0.49 | m ² | 1 | 1.3 | 8400 | 8806 |
| E-112 | Heater | 0.61 | m ² | 1 | 1 | 8400 | 8806 |
| E-113 | Heater | 0.49 | m ² | 1 | 1 | 8900 | 9330 |
| E-114 | Heater | 2.08 | m ² | 1 | 1 | 9400 | 9854 |
| E-115 | Heater | 5.46 | m ² | 1 | 1 | 13100 | 13733 |
| E-116 | Heater | 24 | m ² | 1 | 1.3 | 17800 | 18660 |
| E-117 | Heater | 2.18 | m ² | 1 | 1.3 | 9300 | 9749 |
| E-118 | Heater | 15 | m ² | 1 | 1 | 11500 | 12056 |
| E-119 | Heater | 1.70 | m ² | 1 | 1 | 8900 | 9330 |
| E-120 | Heater | 1.06 | m ² | 1 | 1 | 8900 | 9330 |
| E-121 | Heater | 0.84 | m ² | 1 | 1 | 8900 | 9330 |
| E-122 | Heater | 0.64 | m ² | 1 | 1.3 | 9000 | 9435 |
| FLASH1 | Flash2 | 2.40 | m ³ | 1 | 1 | 16400 | 17192 |

| | | | | | | | |
|-------------------------|--------|-------|-------------------|---|-----|-------------|-------------|
| FLASH2 | Flash2 | 2.40 | m ³ | 1 | 1.3 | 17800 | 18660 |
| FLASH3 | Flash2 | 2.40 | m ³ | 1 | 1.3 | 22300 | 23378 |
| FLASH4 | Flash2 | 2.40 | m ³ | 1 | 1.3 | 16900 | 17717 |
| P-101 | Pump | 4.16 | m ³ /h | 1 | 1.3 | 4300 | 4508 |
| P-102 | Pump | 1E-07 | m ³ /h | 1 | 1 | 16300 | 17088 |
| P-103 | Pump | 0.05 | m ³ /h | 1 | 1 | 16300 | 17088 |
| P-104 | Pump | 2.25 | m ³ /h | 1 | 1 | 57100 | 59859 |
| P-105 | Pump | 1.70 | m ³ /h | 1 | 1 | 59600 | 62480 |
| R-101 | RStoic | 5.56 | m ³ | 2 | 1.3 | 250400 | 262499 |
| R-102 | RStoic | 0.05 | m ³ | 2 | 1.3 | 44600 | 46755 |
| R-103 | RStoic | 4.26 | m ³ | 2 | 1.3 | 229800 | 240904 |
| R-104 | RStoic | 4.47 | m ³ | 2 | 1.3 | 198400 | 207987 |
| V-101 | Mixer | | | | | | |
| V-102 | Mixer | | | | | | |
| V-103 | Valve | | | | | | |
| V-104 | FSplit | | | | | | |
| V-105 | Mixer | | | | | | |
| V-106 | Valve | | | | | | |
| V-107 | Valve | | | | | | |
| V-108 | Mixer | | | | | | |
| Total | | | | | | 6502500 | 6816701 |
| Total, 10 ⁻⁶ | | | | | | 6.50 | 6.82 |

4. Stream table

Table S8. Stream table of the MTO-MOGD model.

| Stream | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|-----------------------|---------------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Temperature | C | 25 | 25 | 430 | 450 | 450 | 85 | 82 | 30 | 30 | 30 | 33 | 30 | 117 | 125 | 103 | 50 | 66 | 290 | 292 | 315 |
| Pressure | bar | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 15 | 2 | 15 | 15 | 15 | 15 | 15 | 10 | 17 | 17 |
| Molar Vapor Fraction | | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Molar Liquid Fraction | | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Mole Flows | kmol/h | 94 | 94 | 94 | 94 | 118 | 118 | 118 | 118 | 93 | 0 | 0 | 25 | 25 | 25 | 25 | 25 | 22 | 0 | 0 | 0 |
| Methanol | kmol/h | 94 | 94 | 94 | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kmol/h | 0 | 0 | 0 | 0 | 94 | 94 | 94 | 94 | 93 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Methane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Ethane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethylene | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Propane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Propylene | kmol/h | 0 | 0 | 0 | 0 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 10 | 10 | 10 | 10 | 10 | 9 | 0 | 0 | 0 |
| n-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Butene | kmol/h | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 |
| n-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclopentane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Pentene | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| n-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Hexene | kmol/h | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|----------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|
| n-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benzene | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Durene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mass Flows | kg/h | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 | 1679 | 0 | 0 | 1321 | 1321 | 1321 | 1321 | 1321 | 1223 | 28 | 28 | 28 |
| Methanol | kg/h | 3000 | 3000 | 3000 | 3000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kg/h | 0 | 0 | 0 | 0 | 1687 | 1687 | 1687 | 1687 | 1679 | 0 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 0 | 0 | 0 |
| Methane | kg/h | 0 | 0 | 0 | 0 | 21 | 21 | 21 | 21 | 0 | 0 | 0 | 21 | 21 | 21 | 21 | 21 | 1 | 0 | 0 | 0 |
| Ethane | kg/h | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 7 | 0 | 0 | 0 | 7 | 7 | 7 | 7 | 7 | 4 | 0 | 0 | 0 |
| Ethylene | kg/h | 0 | 0 | 0 | 0 | 18 | 18 | 18 | 18 | 0 | 0 | 0 | 18 | 18 | 18 | 18 | 18 | 7 | 0 | 0 | 0 |
| Propane | kg/h | 0 | 0 | 0 | 0 | 35 | 35 | 35 | 35 | 0 | 0 | 0 | 35 | 35 | 35 | 35 | 35 | 31 | 0 | 0 | 0 |
| Propylene | kg/h | 0 | 0 | 0 | 0 | 414 | 414 | 414 | 414 | 0 | 0 | 0 | 414 | 414 | 414 | 414 | 414 | 362 | 0 | 0 | 0 |
| n-Butane | kg/h | 0 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 |
| i-Butane | kg/h | 0 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 24 | 24 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|--------------|-------------------|---|---|------|------|------|-----|-----|-----|---|---|---|-----|-----|-----|-----|-----|-----|----|----|----|
| Butene | kg/h | 0 | 0 | 0 | 0 | 265 | 265 | 265 | 265 | 0 | 0 | 0 | 265 | 265 | 265 | 265 | 265 | 260 | 0 | 0 | 0 |
| n-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclopentane | kg/h | 0 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 44 | 44 | 0 | 0 | 0 |
| Pentene | kg/h | 0 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 44 | 44 | 0 | 0 | 0 |
| n-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kg/h | 0 | 0 | 0 | 0 | 116 | 116 | 116 | 116 | 0 | 0 | 0 | 116 | 116 | 116 | 116 | 116 | 116 | 1 | 1 | 1 |
| Hexene | kg/h | 0 | 0 | 0 | 0 | 205 | 205 | 205 | 205 | 0 | 0 | 0 | 205 | 205 | 205 | 205 | 205 | 205 | 0 | 0 | 0 |
| n-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benzene | kg/h | 0 | 0 | 0 | 0 | 64 | 64 | 64 | 64 | 0 | 0 | 0 | 64 | 64 | 64 | 64 | 64 | 64 | 0 | 0 | 0 |
| Durene | kg/h | 0 | 0 | 0 | 0 | 31 | 31 | 31 | 31 | 0 | 0 | 0 | 31 | 31 | 31 | 31 | 31 | 31 | 26 | 26 | 26 |
| Prehnitene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Flow | m ³ /h | 4 | 4 | 2730 | 2809 | 3543 | 484 | 463 | 302 | 2 | 0 | 0 | 301 | 44 | 45 | 35 | 8 | 2 | 0 | 0 | 0 |

Table S8. (cont.).

| Stream | | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
|-----------------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|----------|
| Temperature | C | 345 | 345 | 320 | 135 | 30 | 10 | 10 | 80 | 41 | 30 | 10 | 10 | 21 | 85 | 345 | 44 | 51 | 98 | 200 | 200 |
| Pressure | bar | 17 | 16 | 16 | 16 | 16 | 16 | 14 | 5 | 1 | 1 | 14 | 14 | 16 | 16 | 17 | 10 | 40 | 40 | 40 | 39 |
| Molar Vapor Fraction | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| Molar Liquid Fraction | | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| Mole Flows | kmol/h | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 21 | 21 | 21 | 21 | 9 |
| Methanol | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Methane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Propylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 9 | 9 | 0 |
| n-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Butene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 0 |
| n-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclopentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Pentene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| n-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Hexene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 |
| n-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|----------|----------|----------|----------|----------|-------------|-------------|-------------|-------------|-------------|
| Benzene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Durene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| n-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| n-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| n-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mass Flows | kg/h | 28 | 29 | 29 | 29 | 29 | 29 | 28 | 224 | 224 | 224 | 1 | 1 | 1 | 1 | 1 | 1195 | 1195 | 1195 | 1195 | 1195 |
| Methanol | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 8 | 8 | 8 |
| Methane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| Ethane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 | 4 |
| Ethylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 7 | 0 |
| Propane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 31 | 31 | 31 | 31 | 31 |
| Propylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 362 | 362 | 362 | 362 | 0 |
| n-Butane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 24 |
| i-Butane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 24 | 24 | 24 | 24 | 24 |
| Butene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 260 | 260 | 260 | 260 | 0 |
| n-Pentane | kg/h | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|--------------|-------------------|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|-----|-----|-----|-----|-----|
| Cyclopentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 33 | 33 | 0 | 0 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 44 |
| Pentene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 | 38 | 0 | 0 | 0 | 0 | 0 | 44 | 44 | 44 | 44 | 44 |
| n-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kg/h | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 59 | 59 | 59 | 0 | 0 | 0 | 0 | 0 | 115 | 115 | 115 | 115 | 115 |
| Hexene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 204 | 204 | 204 | 204 | 1 |
| n-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Benzene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 36 | 36 | 0 | 0 | 0 | 0 | 0 | 64 | 64 | 64 | 64 | 64 |
| Durene | kg/h | 26 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 5 | 5 | 5 |
| Prehnitene | kg/h | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kg/h | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 234 |
| n-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 213 |
| n-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 252 |
| n-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 |
| Hydrogen | kg/h | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Volume Flow | m ³ /h | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 19 | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 15 | 2 |

Table S8. (cont.).

| Stream | | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
|-----------------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Temperature | C | 177 | 216 | 222 | 300 | 300 | 135 | 30 | 30 | 32 | 32 | 299 | 135 | 30 | 196 | 30 | 32 | 30 | 42 | 112 | 300 |
| Pressure | bar | 5 | 5 | 40 | 40 | 40 | 40 | 40 | 36 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 36 | 40 | 40 | 40 |
| Molar Vapor Fraction | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| Molar Liquid Fraction | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Mole Flows | kmol/h | 9 | 5 | 5 | 5 | 7 | 7 | 7 | 5 | 5 | 5 | 2 | 2 | 2 | 3 | 3 | 0 | 2 | 2 | 5 | 5 |
| Methanol | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Methane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propane | kmol/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Butene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclopentane | kmol/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pentene | kmol/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kmol/h | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Hexene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|-------------------|-------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|----------|----------|-----------|-----------|
| Benzene | kmol/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Durene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kmol/h | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kmol/h | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kmol/h | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kmol/h | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 5 | 5 |
| Mass Flows | kg/h | 1195 | 941 | 941 | 941 | 951 | 951 | 951 | 948 | 948 | 946 | 591 | 591 | 591 | 356 | 356 | 1 | 4 | 4 | 11 | 11 |
| Methanol | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kg/h | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Methane | kg/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethane | kg/h | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propane | kg/h | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Butane | kg/h | 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| i-Butane | kg/h | 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Butene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | | | | | | | | | |
|--------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|----|----|
| Cyclopentane | kg/h | 44 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 0 | 0 | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 |
| Pentene | kg/h | 44 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 0 |
| n-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kg/h | 115 | 57 | 57 | 57 | 58 | 58 | 58 | 57 | 57 | 57 | 0 | 0 | 0 | 57 | 57 | 0 | 0 | 0 | 0 | 0 |
| Hexene | kg/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kg/h | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benzene | kg/h | 64 | 28 | 28 | 28 | 29 | 29 | 29 | 28 | 28 | 28 | 0 | 0 | 0 | 28 | 28 | 0 | 0 | 0 | 0 | 0 |
| Durene | kg/h | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kg/h | 0 | 0 | 0 | 0 | 106 | 106 | 106 | 106 | 106 | 106 | 3 | 3 | 3 | 103 | 103 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kg/h | 0 | 0 | 0 | 0 | 106 | 106 | 106 | 106 | 106 | 106 | 2 | 2 | 2 | 104 | 104 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kg/h | 234 | 233 | 233 | 233 | 23 | 23 | 23 | 23 | 23 | 23 | 0 | 0 | 0 | 23 | 23 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 97 | 97 | 97 | 97 | 97 | 97 | 92 | 92 | 92 | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 97 | 97 | 97 | 97 | 97 | 97 | 89 | 89 | 89 | 8 | 8 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kg/h | 213 | 213 | 213 | 213 | 21 | 21 | 21 | 21 | 21 | 21 | 20 | 20 | 20 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kg/h | 0 | 0 | 0 | 0 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kg/h | 0 | 0 | 0 | 0 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 114 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kg/h | 252 | 252 | 252 | 252 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kg/h | 0 | 0 | 0 | 0 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kg/h | 0 | 0 | 0 | 0 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kg/h | 132 | 132 | 132 | 132 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kg/h | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 10 | 10 |
| Volume Flow | m ³ /h | 31 | 2 | 2 | 2 | 4 | 3 | 2 | 1 | 5 | 1 | 1 | 1 | 1 | 105 | 1 | 4 | 1 | 1 | 4 | 6 |

Table S8. (cont.).

| Stream | | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
|-----------------------|---------------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|----------|----------|----------|
| Temperature | C | 109 | 50 | 88 | 25 | 309 | 25 | 145 | 30 | 40 | 12 | 10 | 20 |
| Pressure | bar | 5 | 5 | 5 | 1 | 17 | 1 | 40 | 2 | 2 | 15 | 14 | 5 |
| Molar Vapor Fraction | | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| Molar Liquid Fraction | | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Mole Flows | kmol/h | 4 | 4 | 3 | 0 | 0 | 4 | 4 | 93 | 93 | 3 | 0 | 1 |
| Methanol | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | 93 | 0 | 0 | 0 |
| Methane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Ethane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Propane | kmol/h | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Propylene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| n-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Butane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Butene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclopentane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pentene | kmol/h | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kmol/h | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | |
|-------------------|-------------|------------|------------|------------|----------|----------|----------|----------|-------------|-------------|-----------|----------|-----------|
| Benzene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Durene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kmol/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kmol/h | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 0 |
| Mass Flows | kg/h | 255 | 255 | 196 | 0 | 0 | 7 | 7 | 1679 | 1679 | 98 | 0 | 59 |
| Methanol | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DME | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Water | kg/h | 8 | 8 | 7 | 0 | 0 | 0 | 0 | 1679 | 1679 | 0 | 0 | 0 |
| Methane | kg/h | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 1 |
| Ethane | kg/h | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 4 |
| Ethylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 |
| Propane | kg/h | 31 | 31 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 30 |
| Propylene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 0 | 0 |
| n-Butane | kg/h | 23 | 23 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| i-Butane | kg/h | 23 | 23 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 16 |
| Butene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 |
| n-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Pentane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | | | | | | |
|--------------|------|----|----|----|---|---|----|---|---|---|---|---|---|
| Cyclopentane | kg/h | 33 | 33 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pentene | kg/h | 38 | 38 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cyclohexane | kg/h | 58 | 58 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexene | kg/h | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Benzene | kg/h | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Durene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Prehnitene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Isodurene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Dodecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Dodecene | kg/h | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Hexadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hexadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Octadecane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Octadecene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| n-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| i-Eicosane | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Eicosene | kg/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen | kg/h | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 0 | 0 | 0 |
| Volume Flow | m³/h | 25 | 3 | 0 | 2 | 0 | 88 | 3 | 2 | 2 | 4 | 0 | 6 |