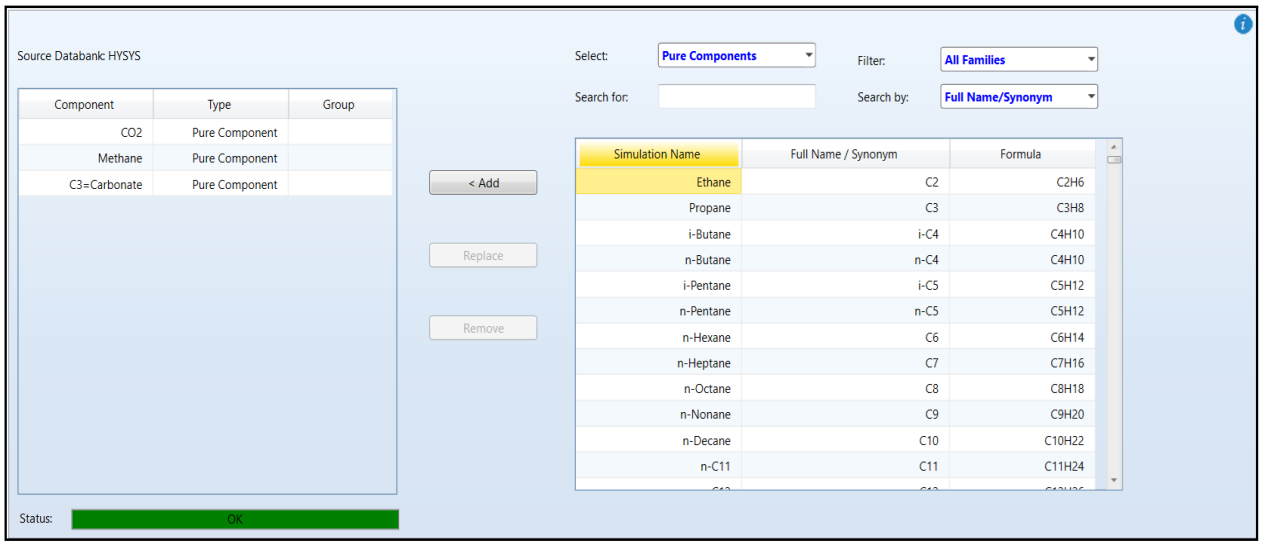
Absorber Simulation

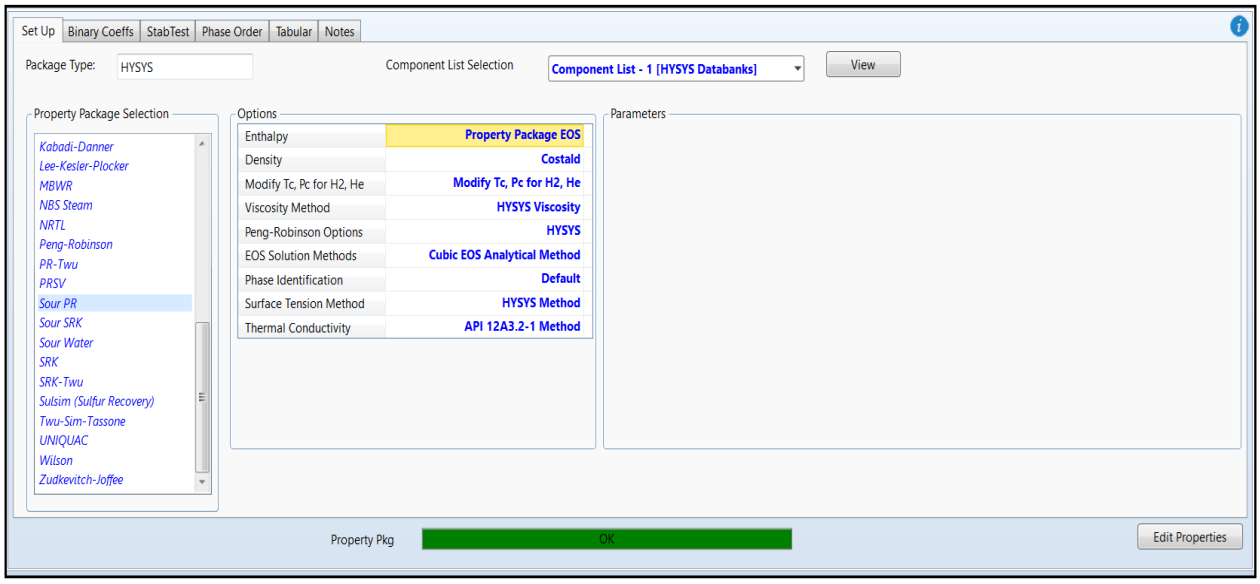
Example: In order to eliminate CO_2 from a gas stream with flowrate of 300 kmole/hr. and composition of 20 mole% CO_2 and 80% methane, a packing column functioning as absorber is used. In this regard, 2000 kmole/hr. pure propylene carbonate is used as solvent. The operating temperature and pressure are 60C and 6090 kPa respectively. Determine the mole fraction of CO_2 in outlet gas stream. Use Sour PR as the fluid package.

How to simulate:

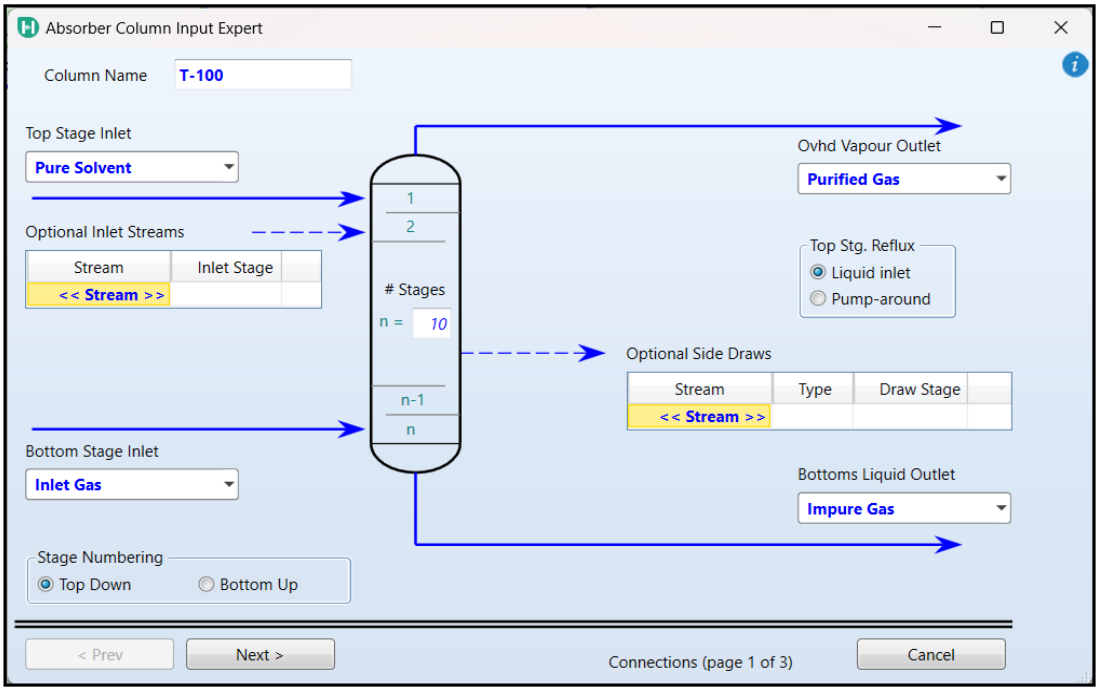
1.Add the components to the component list



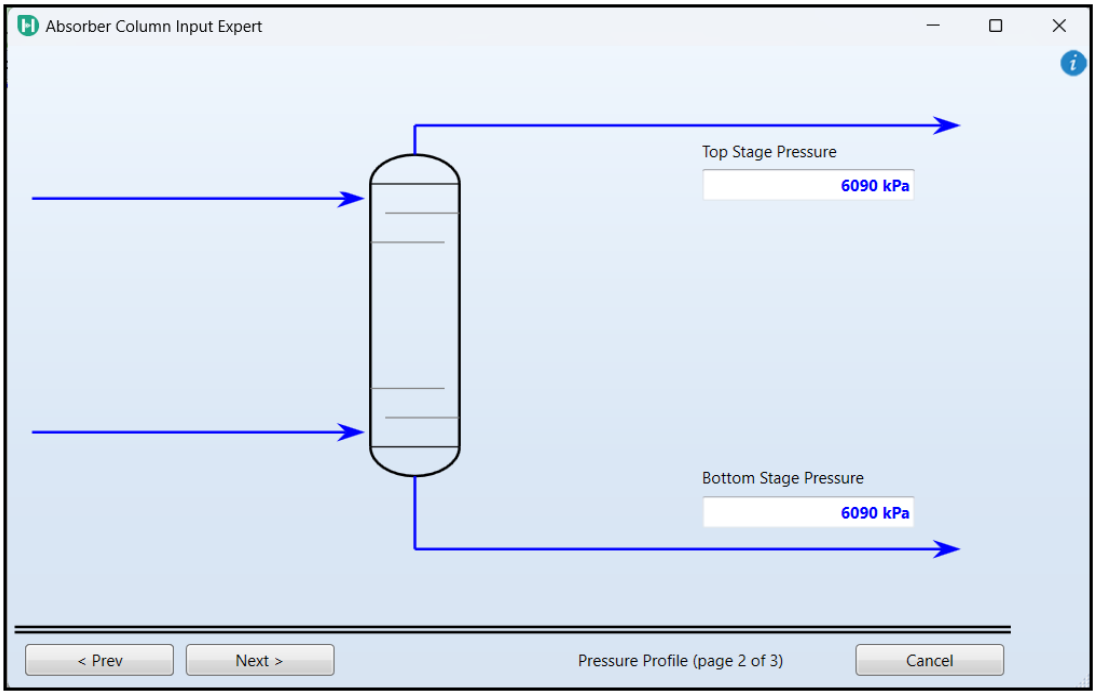
2.Select Sour PR as the Fluid Package.



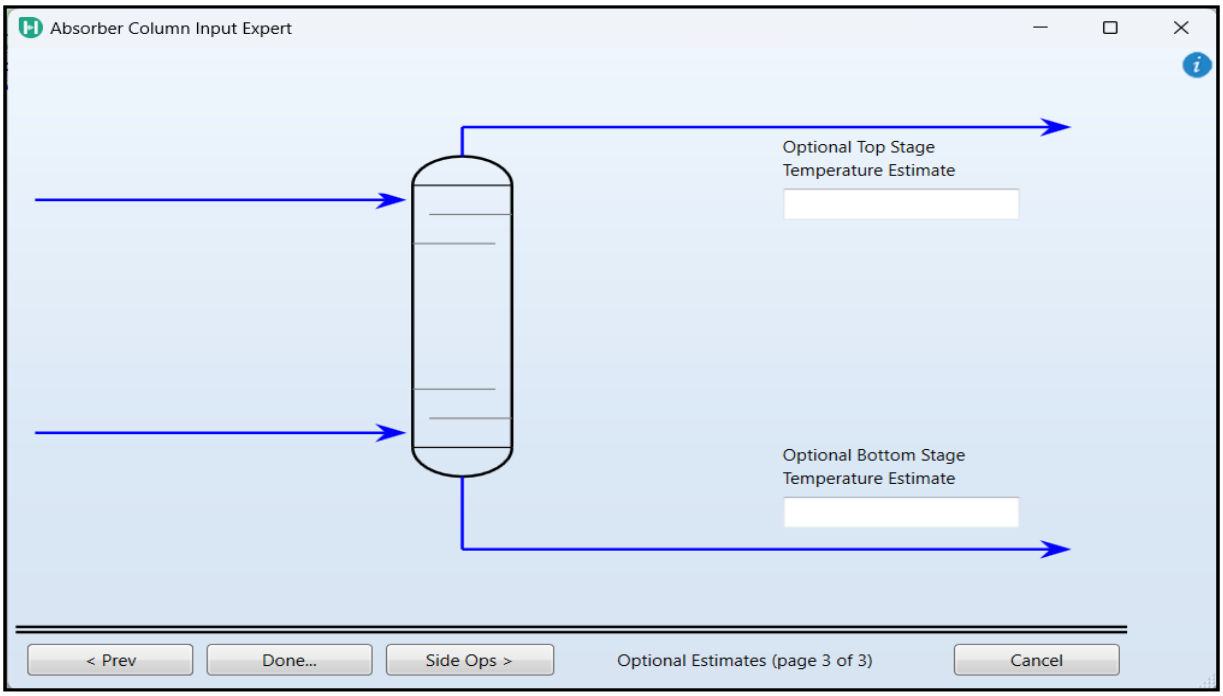
3.Enter Simulation Environment and select an Absorber from Model Pallete/Separator. Define streams Pure Solvent, Inlet Gas, Purified Gas, Impure Gas. Then click Next.



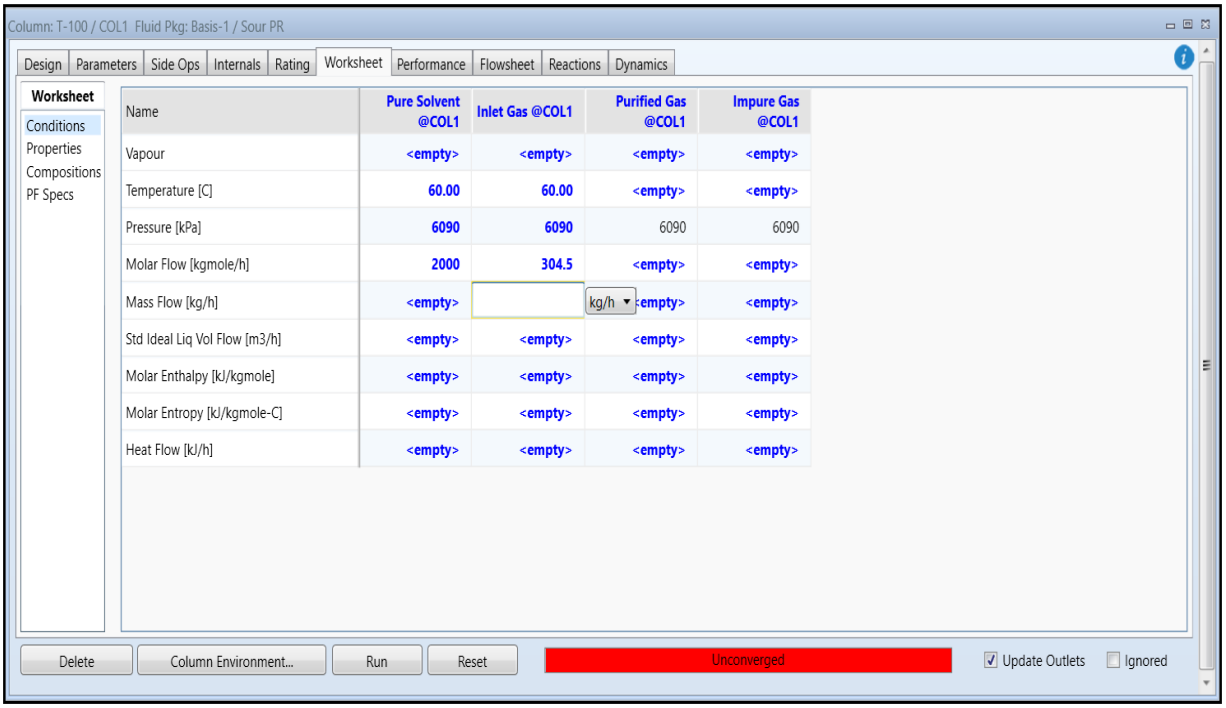
4. Specify the top and bottom stage.

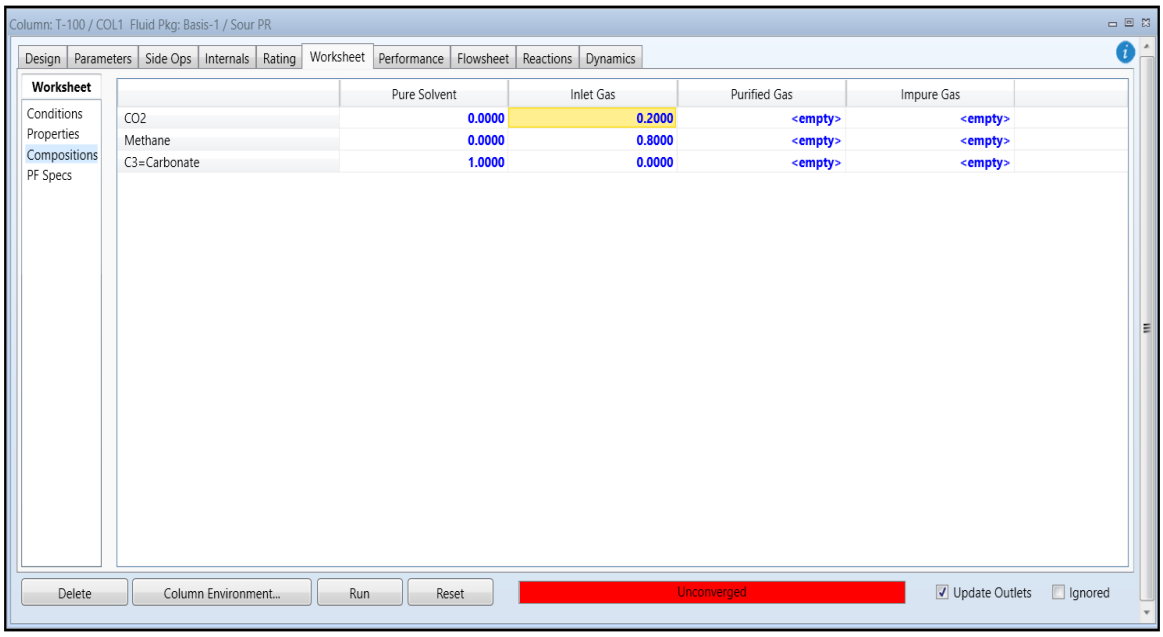


5.Let Aspen decide for the page and click Done.

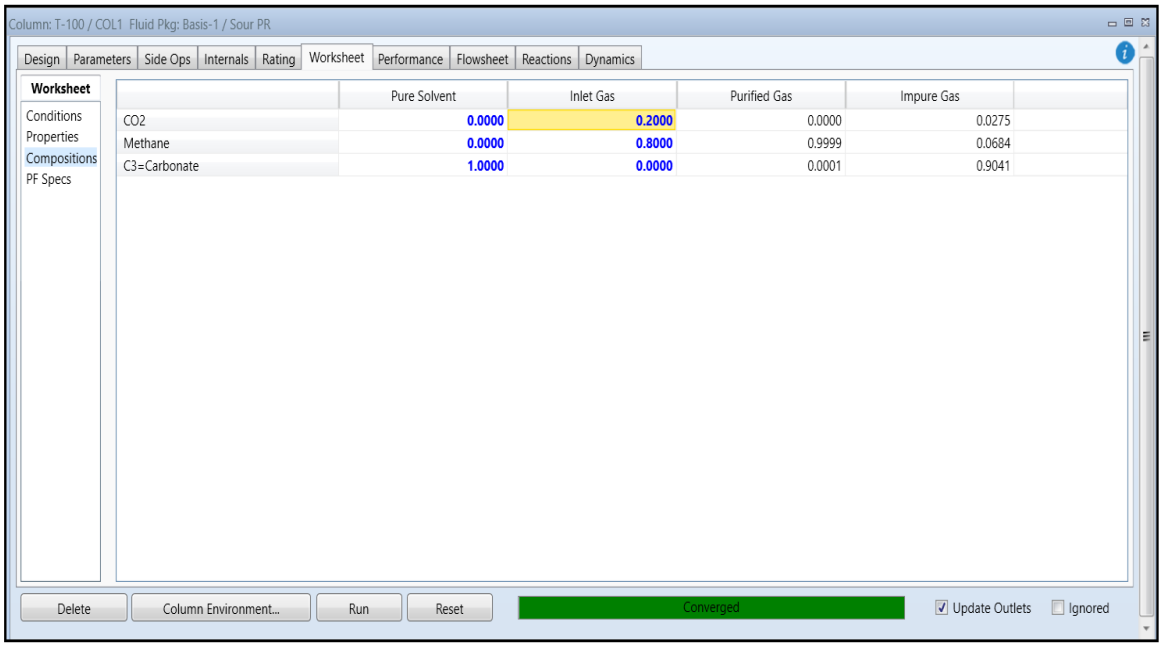


6.Now go to Worksheet and provide the operating condition and composition.

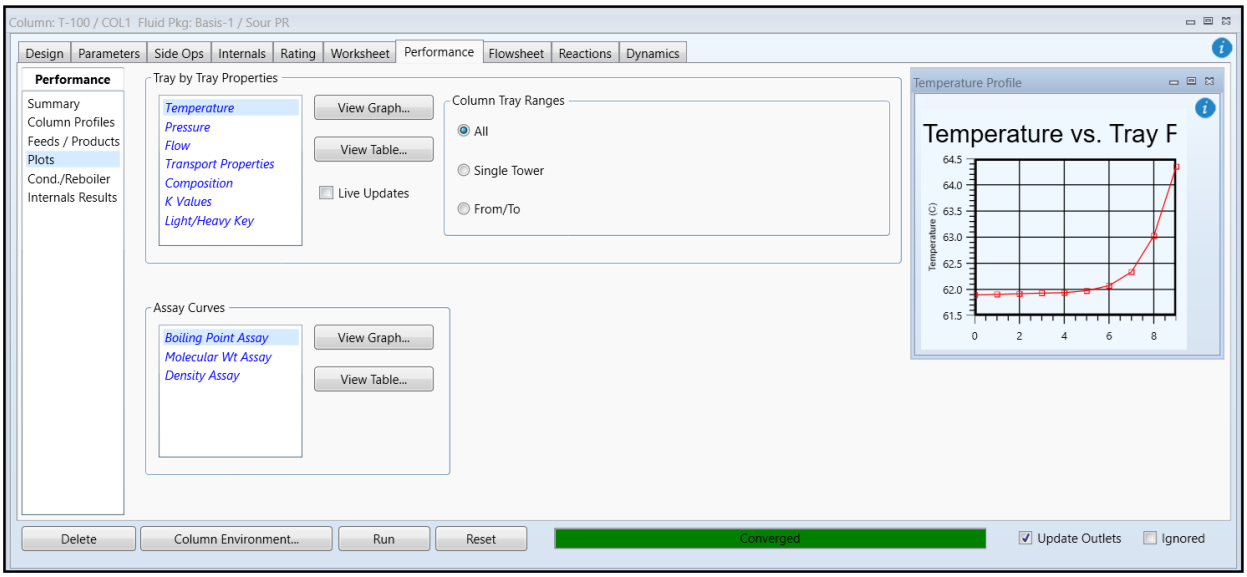




7. Results



Based on the results, 99% of purified gas is methane which is our desired objective in the example.


Column: T-100 / COL1 Fluid Pkg: Basis-1 / Sour PR
Design
Parameters
Side Ops
Internals
Rating
Worksheet
Performance
Flowsheet
Reactions
Dynamics
Performance
Summary
Column Profiles
Feeds / Products
Plots
Cond./Reboiler
Internals Results
Tray by Tray Properties
Temperature
Pressure
Flow
Transport Properties
Composition
K Values
Light/Heavy Key
View Graph...
View Table...
Live Updates
Column Tray Ranges
All
Single Tower
From/To
Assay Curves
Boiling Point Assay
Molecular Wt Assay
Density Assay
View Graph...
View Table...
Temperature Profile
Temperature vs. Tray F
Temperature (C)
64.5
64.0
63.5
63.0
62.5
62.0
61.5
0
2
4
6
8
Delete
Column Environment...
Run
Reset
Converged
Update Outlets
Ignored