Cooling Tower: An Aspen Plus® Tutorial

by

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Overview

Aspen Plus® is a powerful, world-class computer program that can simulate diverse chemical unit operations.

This tutorial provides a step-by-step guide to students who (1) are presently studying cooling towers and (2) have had no prior experience using Aspen Plus®.

The specific physical application in this tutorial is the simulation of a laboratory-scale packed-bed column with an air stream flowing countercurrently to a water stream. Chemical engineering textbooks commonly examine this problem. Students may thus compare the numerical solution generated by Aspen Plus® with predictions using spreadsheets based upon elementary textbook methods.

Having completed this tutorial, students will be able to examine what-if scenarios with cooling towers. In addition, students, on their own, will be able to start to play with the Aspen Plus® package to explore its extensive features.

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N o t e

This tutorial was developed using Aspen Plus® version 8.2.

Problem Statement
Predict the cooling performance of a packed-bed tower in a unit operations laboratory.

The tower has an inside diameter of 80 mm. The packed section has a length of 1.27 m and consists of dumped glass Raschig-style rings. The dimensions of the rings are: an ID of 8 mm, an OD of 10 mm, and a height of 9 mm.

Dry air at a flow rate of 3 mol/min is fed to the bottom of the tower at a temperature of 22.07 °C and a pressure of 103,184 Pa.

Water is fed to the top of the column at a mass flow rate of 1 kg/min, at a temperature of 39.58 °C and at a pressure of 101,931 Pa.

The pressure at the top of the tower is ambient, 101,000 Pa. The pressure drop across the packed bed is 5 inH_2O.

Characterize the performance in terms of the flow rate, temperature, pressure, and composition of the gas outlet stream at the top of the column and liquid outlet stream at the bottom of the column.

Tips

Several issues may baffle students in applying Aspen Plus® to this particular problem. Here are some tips. The tutorial presents step-by-step screen shots.

Tip 1 – Learning from this tutorial

If you are new to Aspen Plus®, I suggest running the case identically to this tutorial and then save it as a base case. It can serve as a foundation for future work.

Thus, when applying the methodology to simulate a similar experimental trial or solve a similar problem, one can copy the bkp file from the tutorial and rename it to the case at hand.

Tip 2 – Saving Files

Dr. Chella recommends saving Aspen Plus® files in the bkp format (rather than the default apwz format or apw format). The bkp files are text files and, hence, are much less likely to be corrupted.

Tip 3 – Vocabulary

This tutorial uses the words column and tower interchangeably to describe the shell containing the packed bed.

Cooling tower and absorber are used interchangeably in this tutorial.

Tip 4 – Patience

The present version of Aspen Plus® is taking four to five minutes to boot up in the computers at the FAMU-FSU College of Engineering. Similarly, some of the setup steps are taking several minutes. Be patient!!

Tip 5 – Henry's components

The user of process software must specify the model to characterize vapor-liquid equilibrium. Henry's Law provides a good description for gases that have low solubility in water.

Aspen Plus® cannot apply Henry's Law to air, however. This tutorial therefore approximates air as a mixture of nitrogen (0.7808 mole fraction), oxygen (0.2095 mole fraction), argon (0.0093 mole fraction), and carbon dioxide (0.0004 mole fraction).[1]

The user must explicitly specify to treat nitrogen, oxygen, argon, and carbon dioxide as Henry's components. The software fails to deduce this on its own.

[1] Atmosphere of Earth. (2014, January 19). In Wikipedia, The Free Encyclopedia. Retrieved 17:41, January 19, 2014, from http://en.wikipedia.org/wiki/Atmosphere_of_Earth

Tip 6 – Flowsheet

The flowsheet icon for the cooling tower should show an inlet arrow at the top of the tower and an inlet arrow at the bottom of the tower.

The RadFrac icon on the flowsheet, however, initially displays only one feed point for the tower and it is located in the middle of the tower.

The user just needs to be persistent. First, connect one feed stream (e.g. the gas stream) to the inlet arrow in the middle of the column. Second, drag the feed arrow to the desired location on the tower (e.g., the bottom of the tower). A new feed arrow then appears in the middle of the column, which the user can connect to another stream and move it to the desired location (e.g., the top of the tower).

Tip 7 – Stage numbers

The RadFrac model requires a minimum of two stages. Because inlets and outlets are located only at the ends of the columns, there is no need for more than two stages.

Note: Preliminary investigations by students, who explored using more than two stages, revealed that the calculation will often crash.

Tip 8 – Rate-based model

Students commonly use equilibrium models. That is, on a given stage, all the vapor and liquid are assumed to be in thermodynamic equilibrium.

This tutorial employs a rate-based model that employs heat-transfer and mass-transfer correlations. The screen shots of this tutorial show the user how to set up this model.

Tip 9 – Report file

The tutorial shows the user how to create a complete report as a text file. Just press CTRL + ALT + R and then select Simulation from the drop-down menu. Such a report is included at the end of the tutorial as an example.

The method for booting up Aspen Plus® will depend on the specific installation.

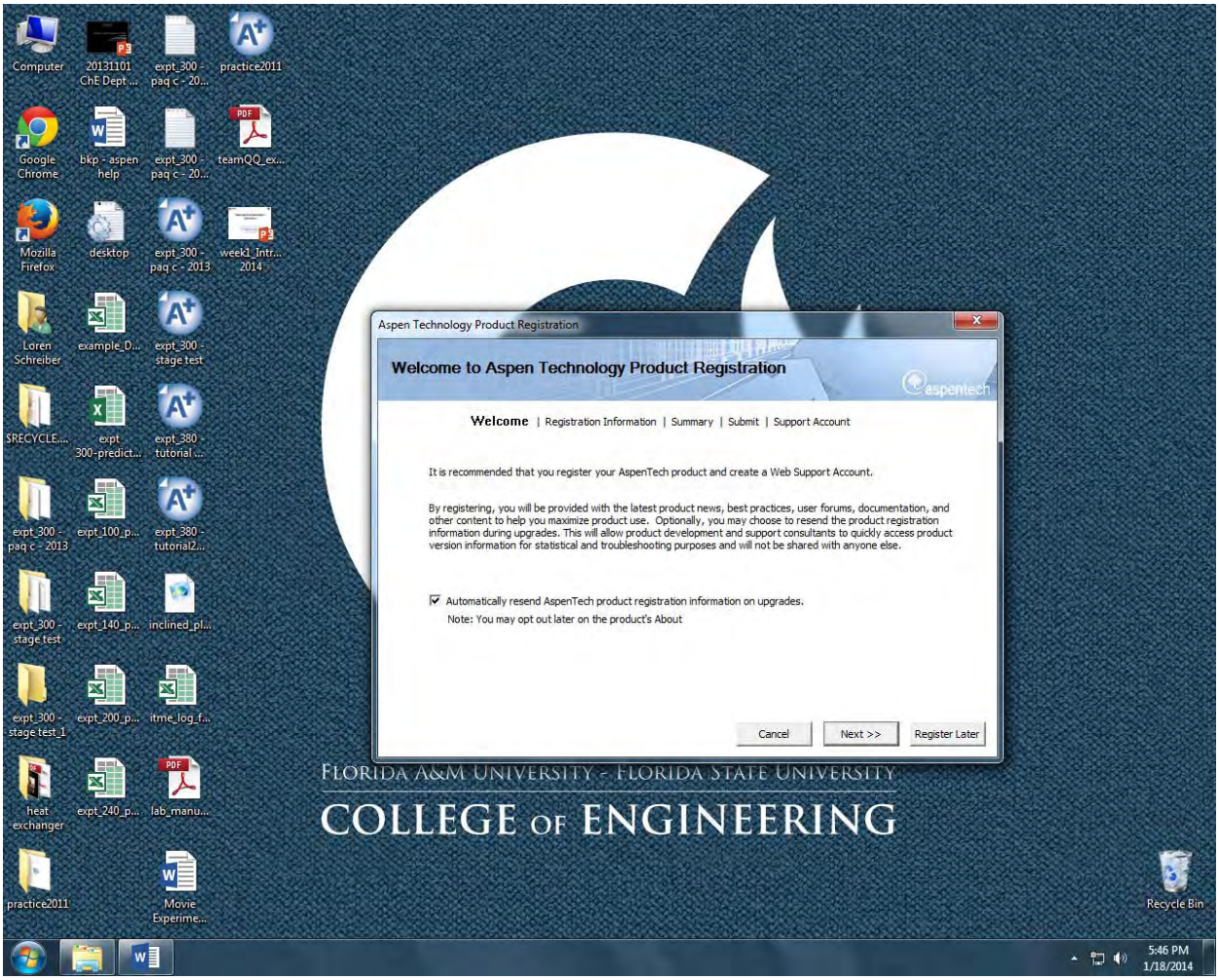
Here's the method at the FAMU-FSU College of Engineering in January 2014.

Click on the **Start** button and then **All Programs** in Windows.

Search the program menu.

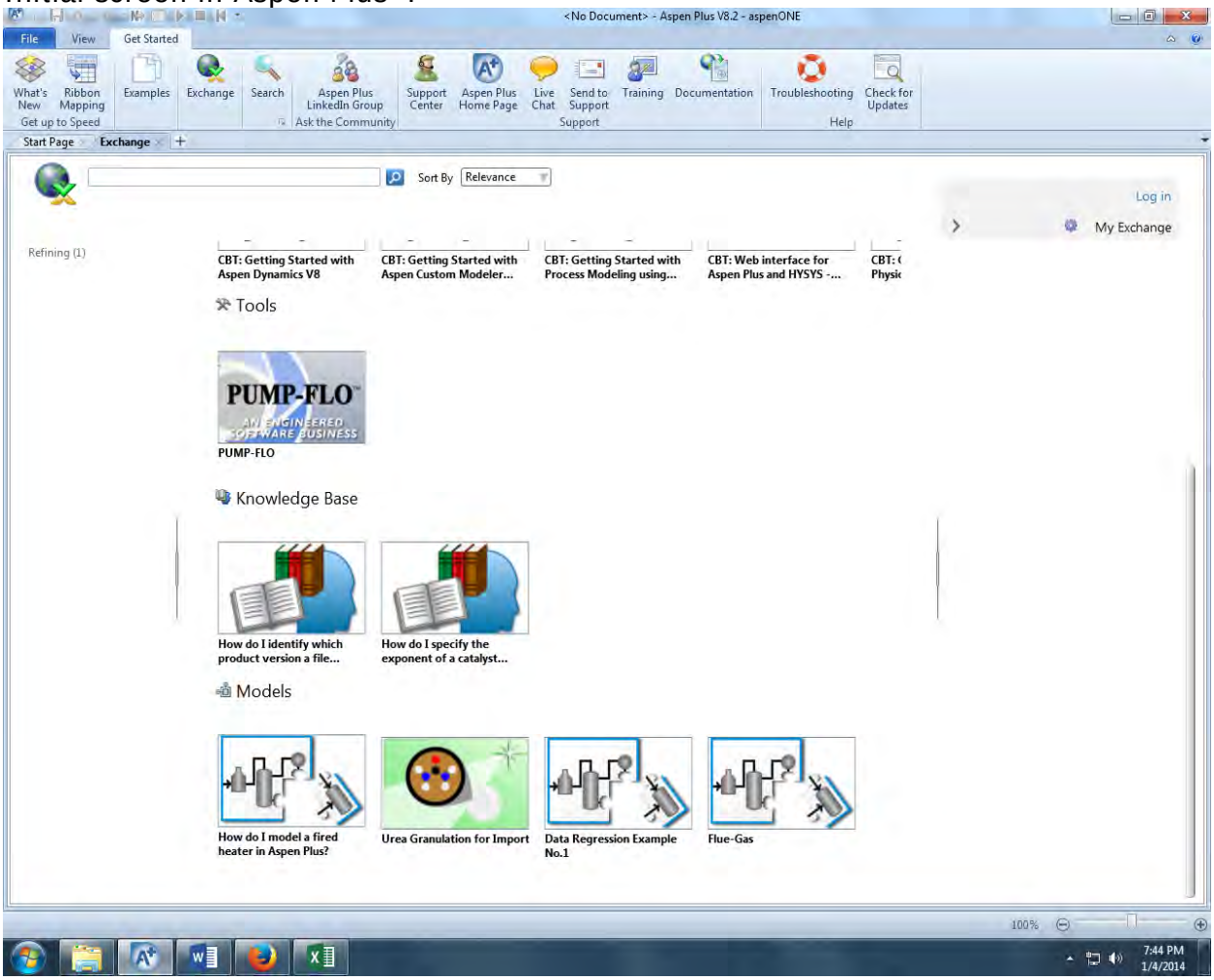
Click on:
AspenTech >> **Process Modeling V8.2** >> **Aspen Plus** >> **Aspen Plus V8.2**


Computer
20131101 ChE Dept ...
expt_300 - paq c - 20...
practice2011
Google Chrome
bkp - aspen help
expt_300 - paq c - 20...
teamQQ_ex...
Mozilla Firefox
desktop
expt_300 - paq c - 2013
week1_Intr... 2014
Loren Schreiber
example_D...
expt_300 - stage test
$RECYCLE....
expt 300-predict...
expt_380 - tutorial ...
Working Model
XLaunch
XPS Viewer
Accelrys
Accessories
Advanced Design System 2009 Update 1
Altera 12.1 Build 177
AspenTech
Uninstall AspenTech Software
Economic Evaluation V8.0
Process Modeling V8.0
Process Modeling V8.2
Aspen HYSYS
Aspen Plus
Aspen Plus Simulation Engin
Aspen Plus User Interface Cu
Aspen Plus V8.2
PROII to Aspen Plus converte
Select Compiler for Aspen Pl
Aspen Properties
Back
Search programs and files
Computer
Control Panel
Devices and Printers
Log off
A&M UNIVERSITY - FLORIDA STATE UNIVERSITY
LLEGE OF ENGINEERING
Recycle Bin
5:30 PM
1/18/2014



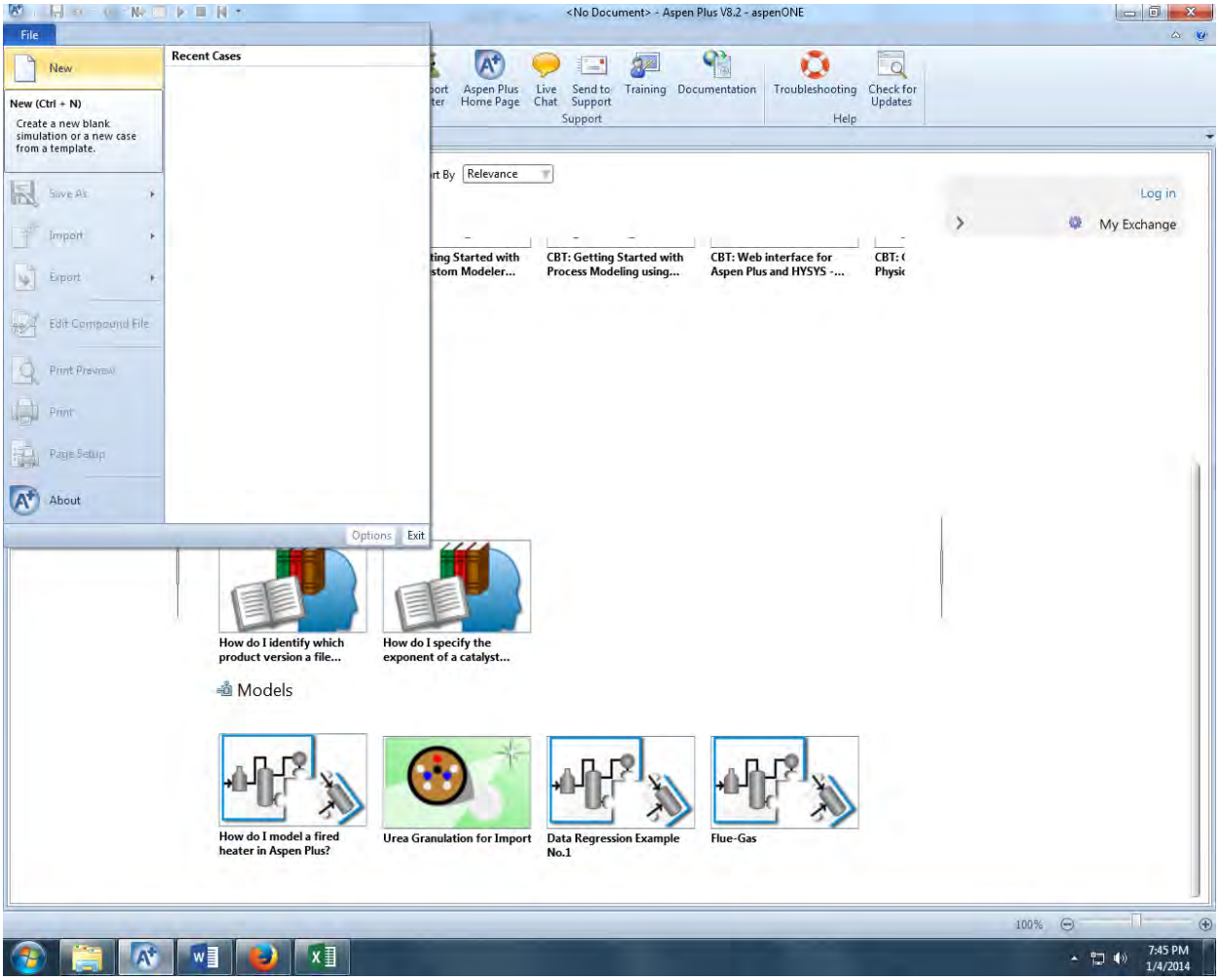
Click the **Register Later** button at the Registration screen.

Initial screen in Aspen Plus®.

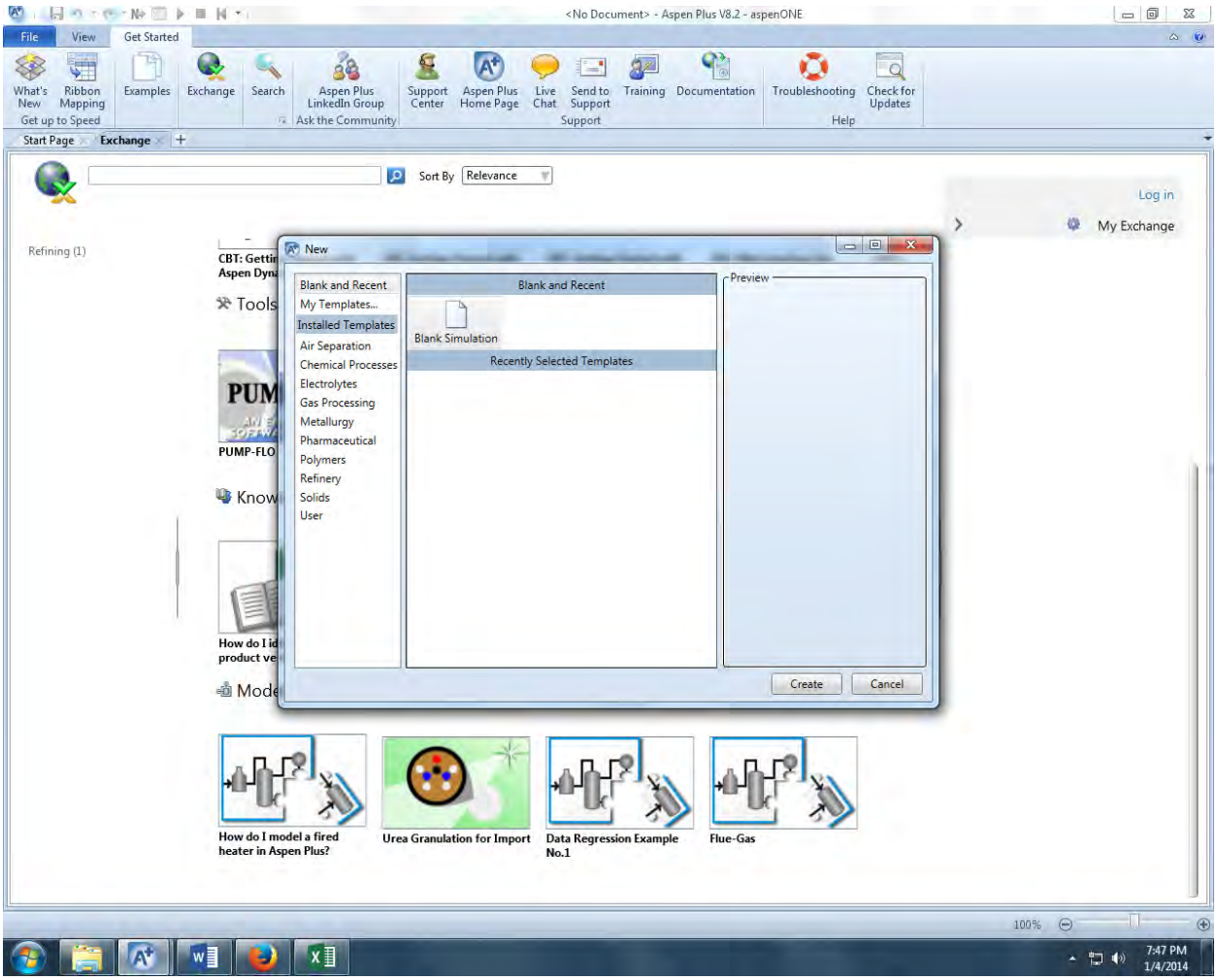


Note: The title bar at the top of the window indicates <No Document>.

Next step:
Click on **File** on the menu bar at the top left corner of the screen.

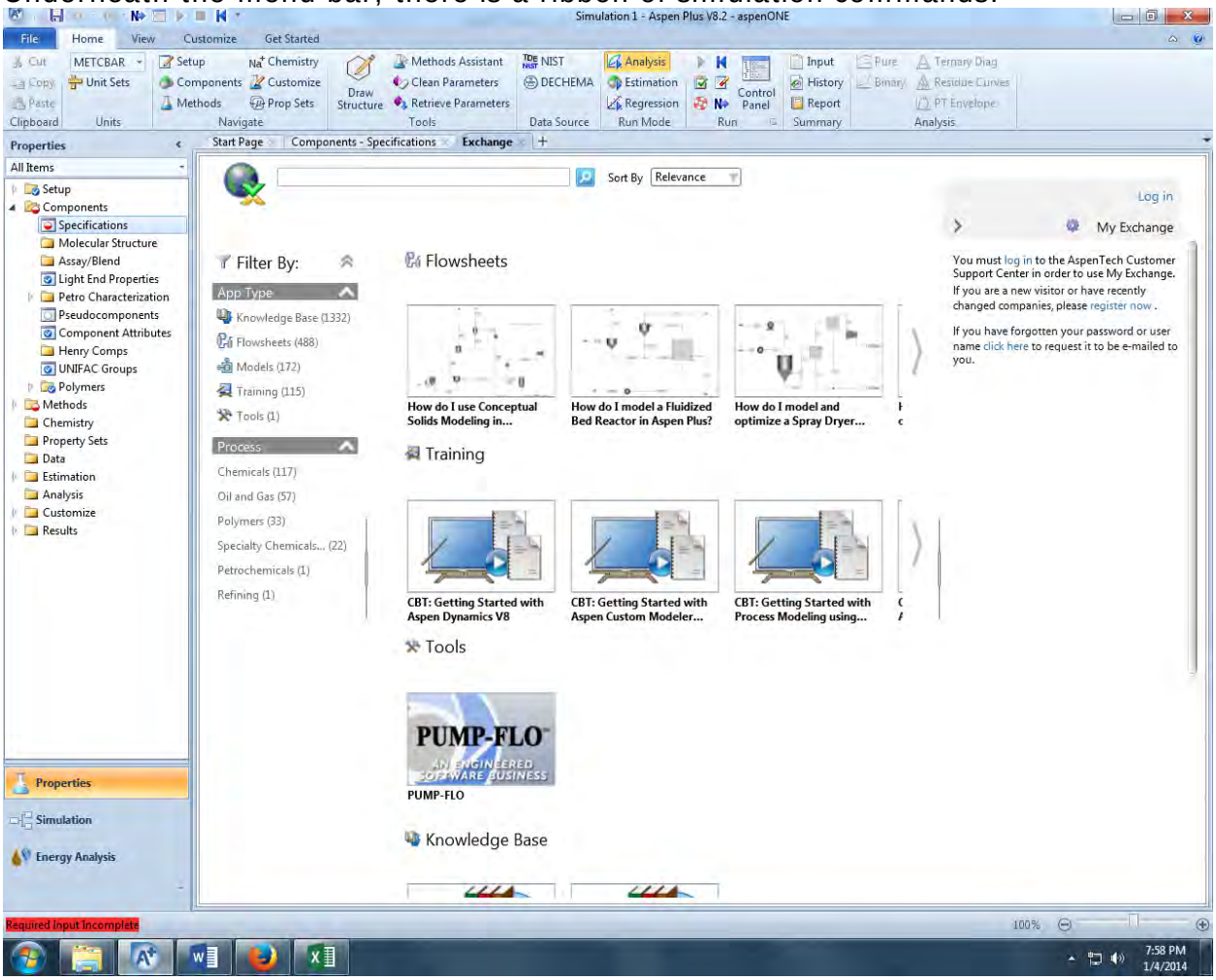


Next step:
Click **New**.



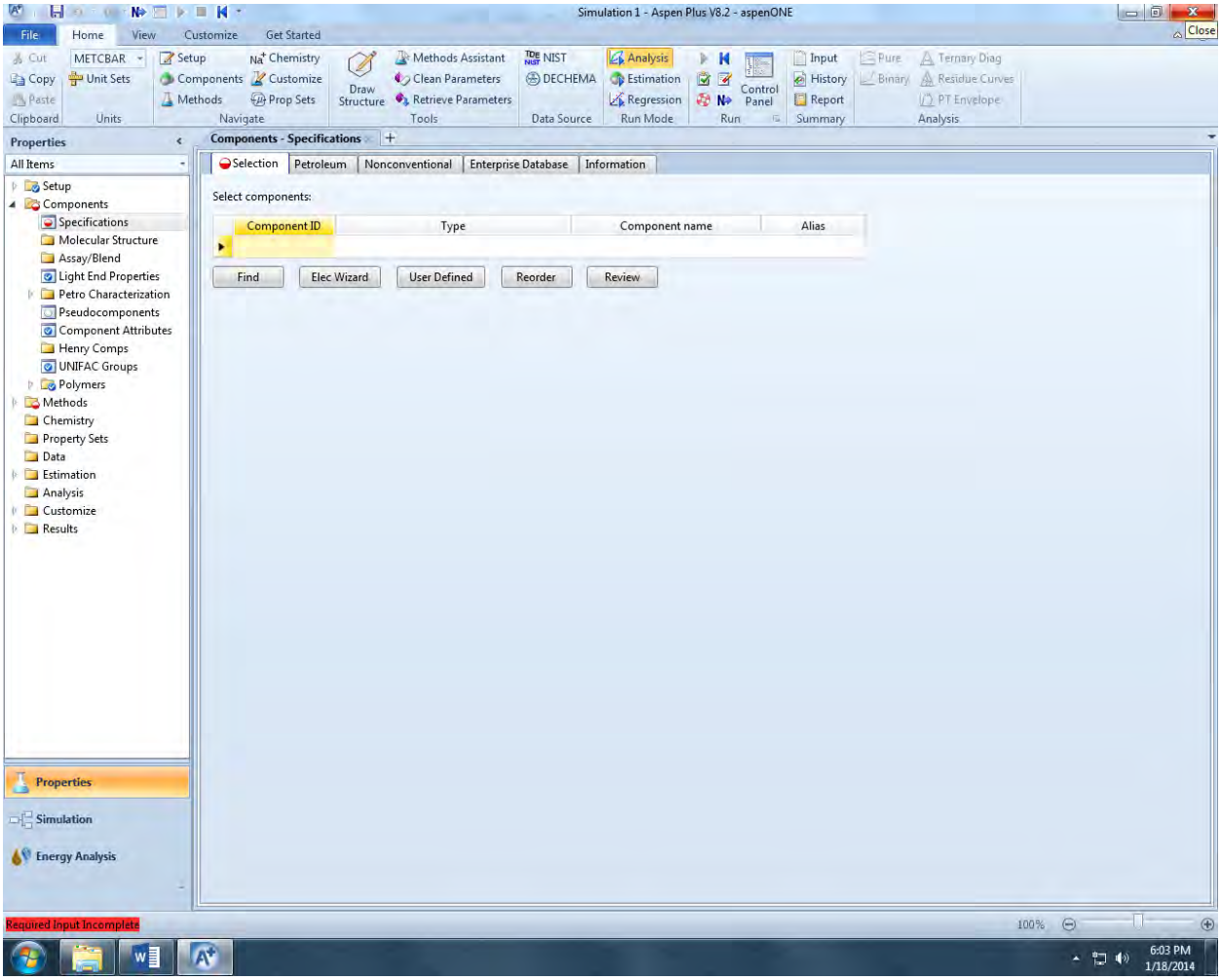
Next step:
Click the **Create** button at the bottom of the window to create a Blank Simulation

The title at the top of the window is now Simulation 1.
Underneath the menu bar, there is a ribbon of simulation commands.



Let's first clean up the main window.

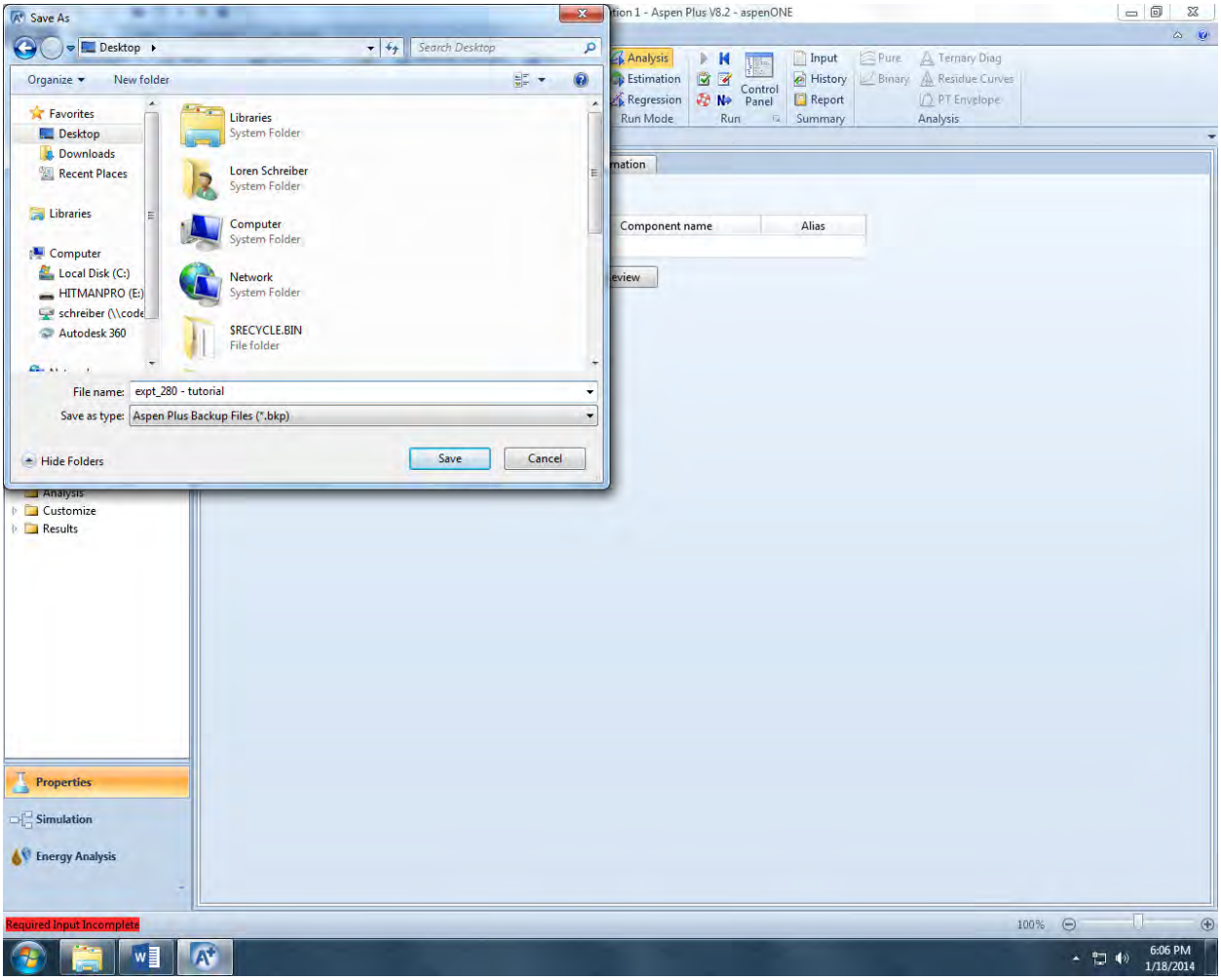
Delete the tabs for **Start Page** and **Exchange**.



By saving the file periodically, we minimize loss of work in the event of a system crash.

Let's save the file now.

Click on **File** >> **Save As**.



Select a convenient location to save the file. In this case, I chose my **Desktop**.

Name the file with an informative description. In this case, **expt_280 – tutorial**.

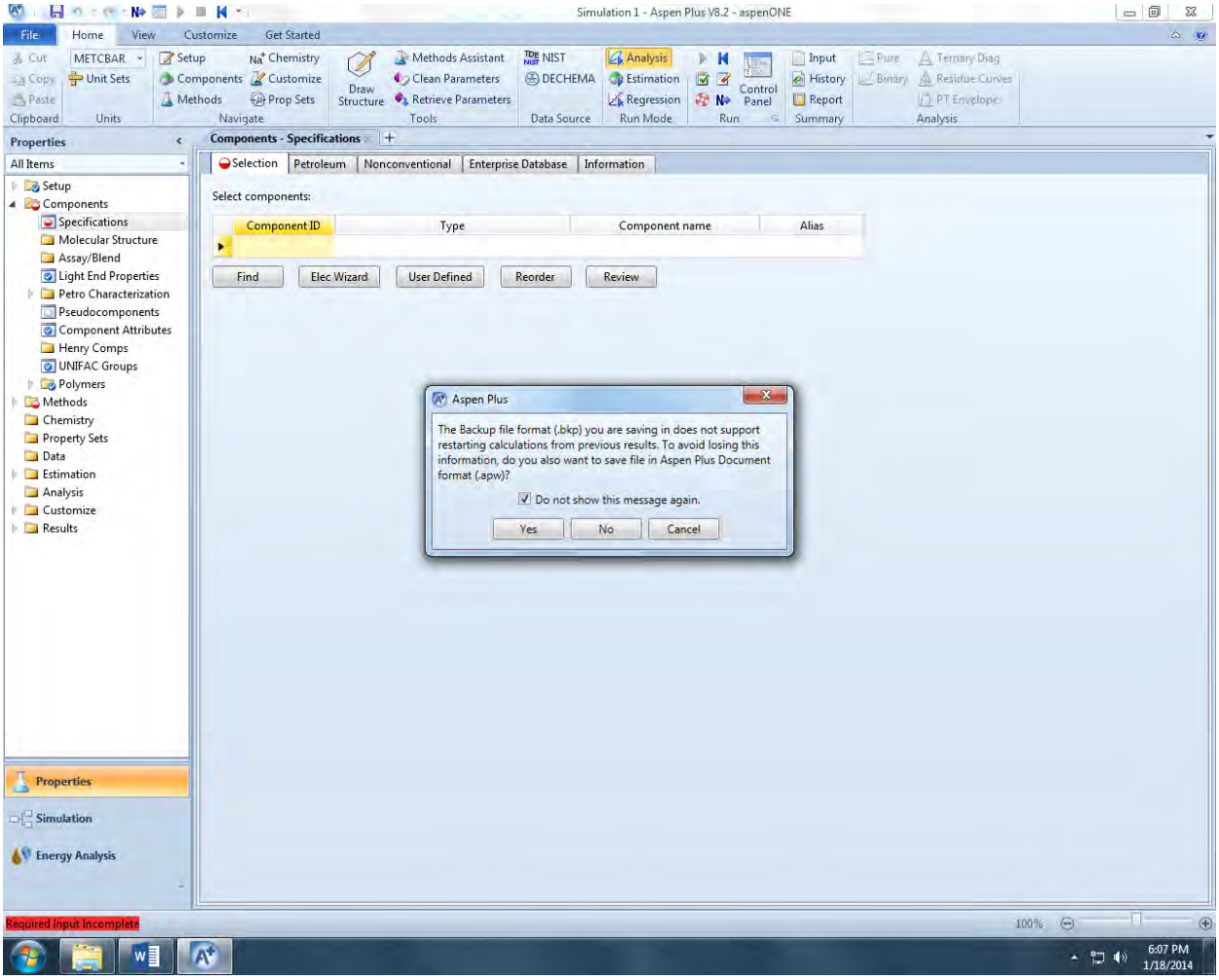
Then set: Save as type **Aspen Plus Backup File (*.bkp)**.

The bkp type has a primitive file structure; it's just a text file.

Our experience has shown it is much less likely to be corrupted.

Avoid saving as an apw file or apwz file, even though Aspen Plus® points you to them.

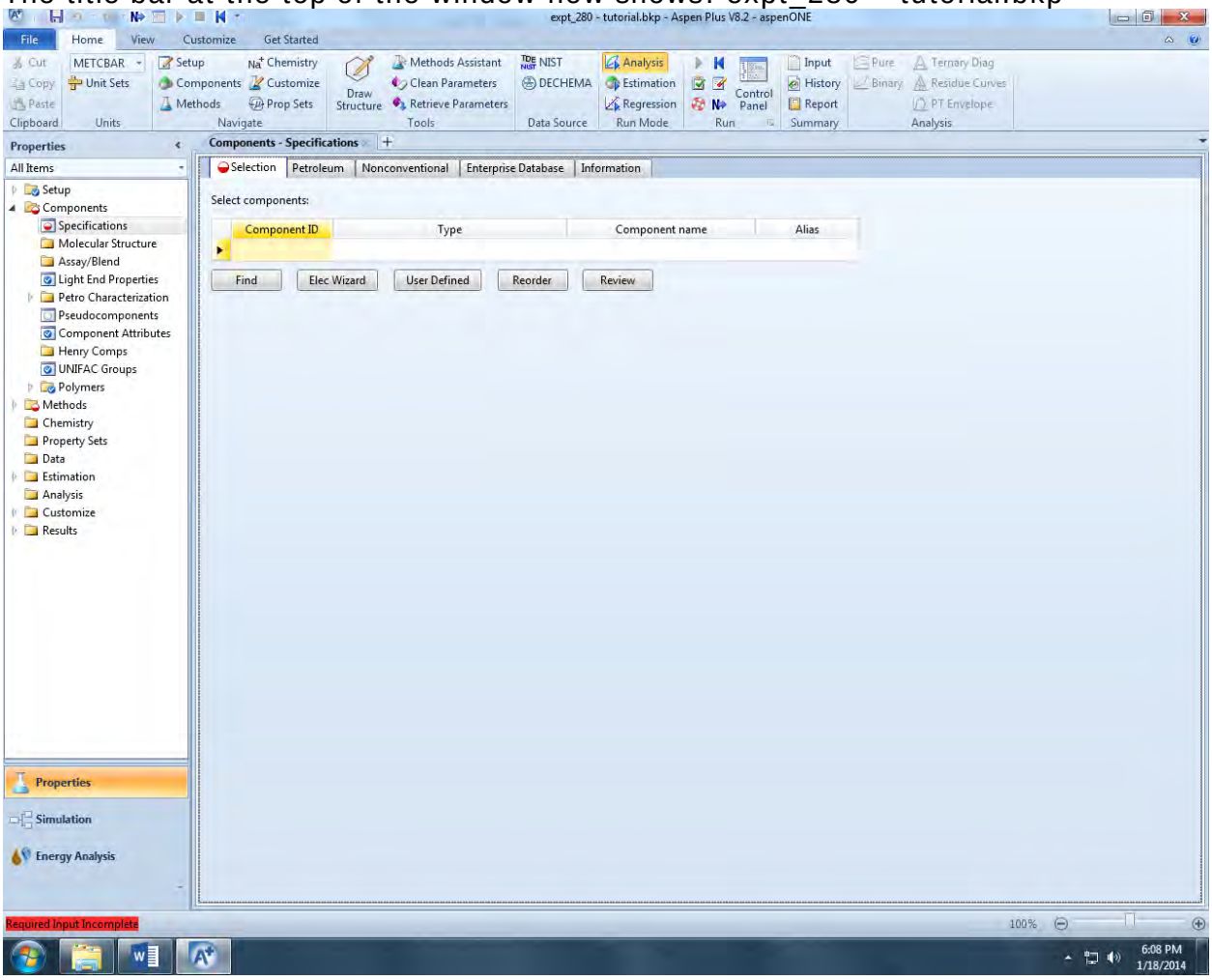
Click the **Save** button.



Mark the checkbox for: Do not show this message again.

Then, click the **No** button.

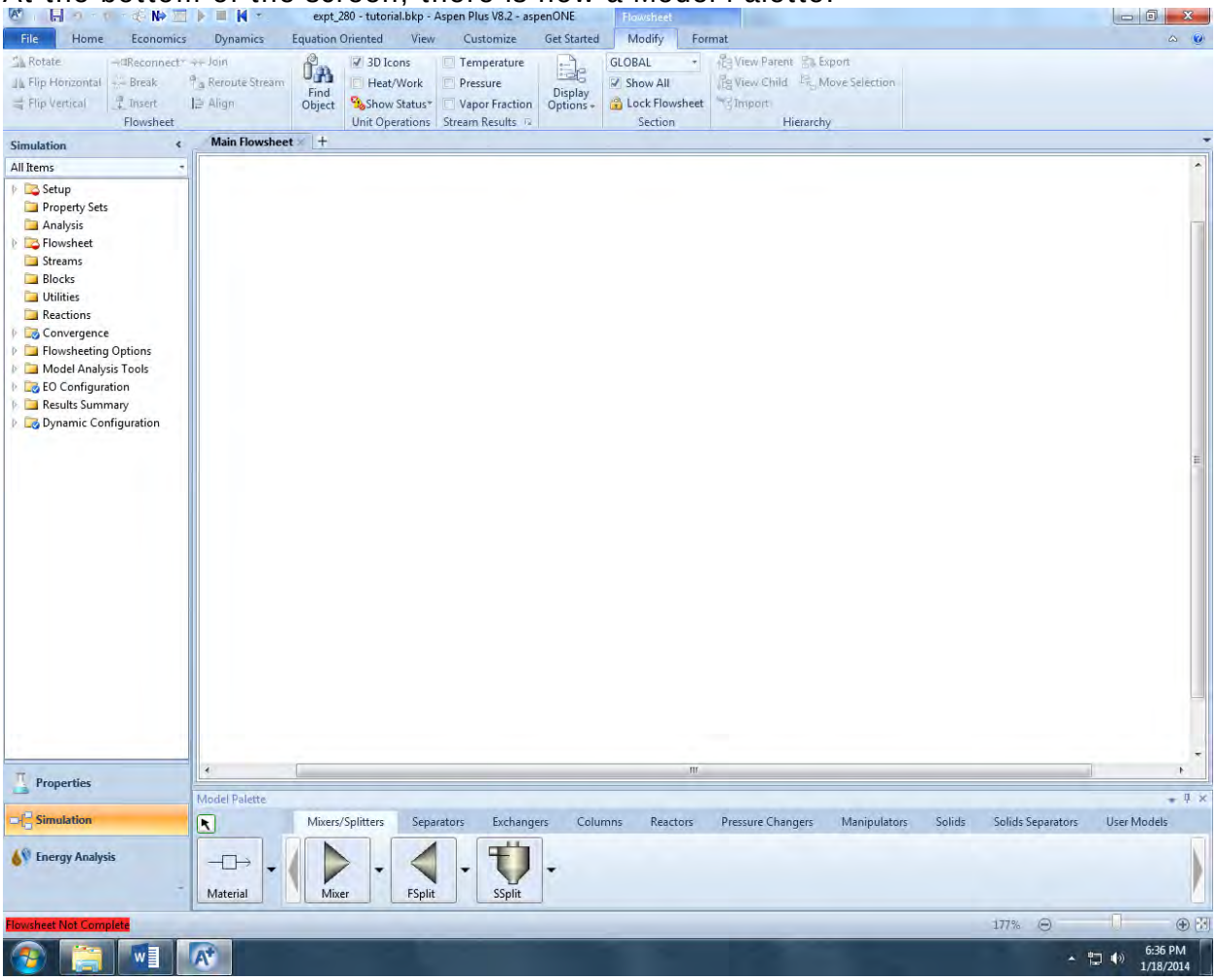
The title bar at the top of the window now shows: expt_280 – tutorial.bkp



Note: The Navigation Pane is the area on the left side of the screen listing various links in a tree structure. It indicates, at the bottom, that the program is presently in the Properties branch.

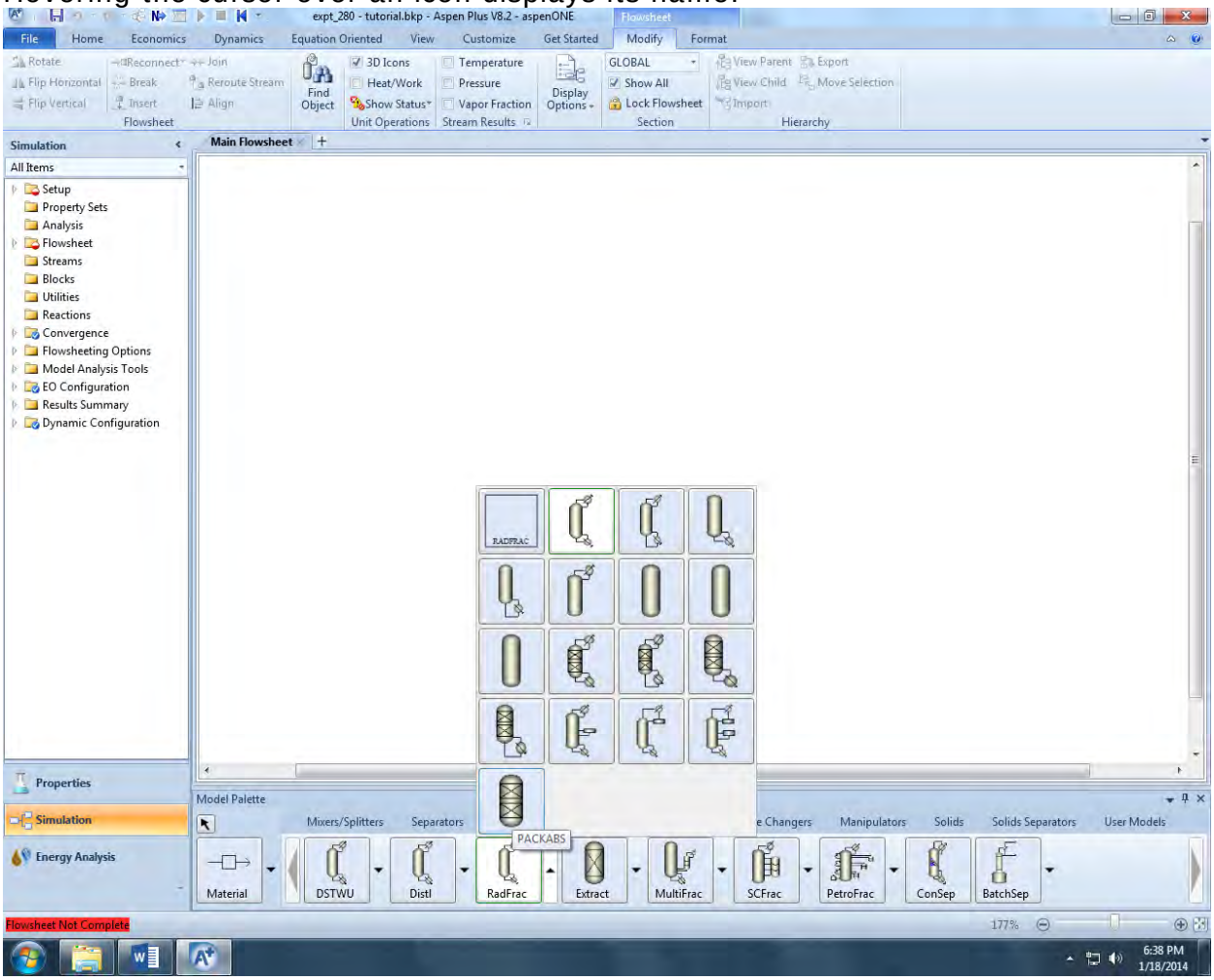
Next step:
Click on **Simulation** at the bottom of the Navigation Pane.

To the right of the Navigation Pane, there is now a tab for the Main Flowsheet.
At the bottom of the screen, there is now a Model Palette.



Next step:
Select from the Model Palette: **Columns** >> **Radfrac**.

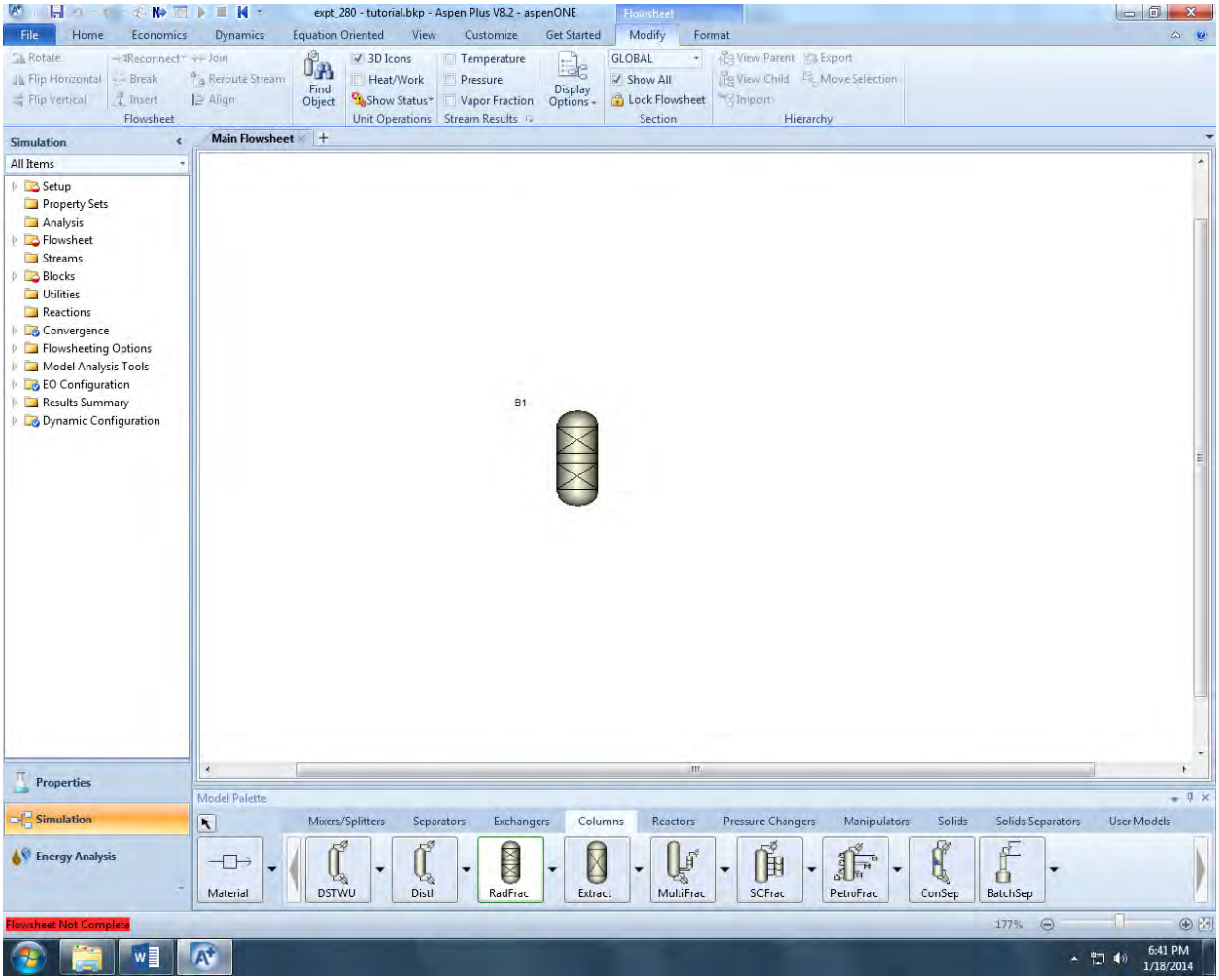
Hovering the cursor over an icon displays its name.



Next step:

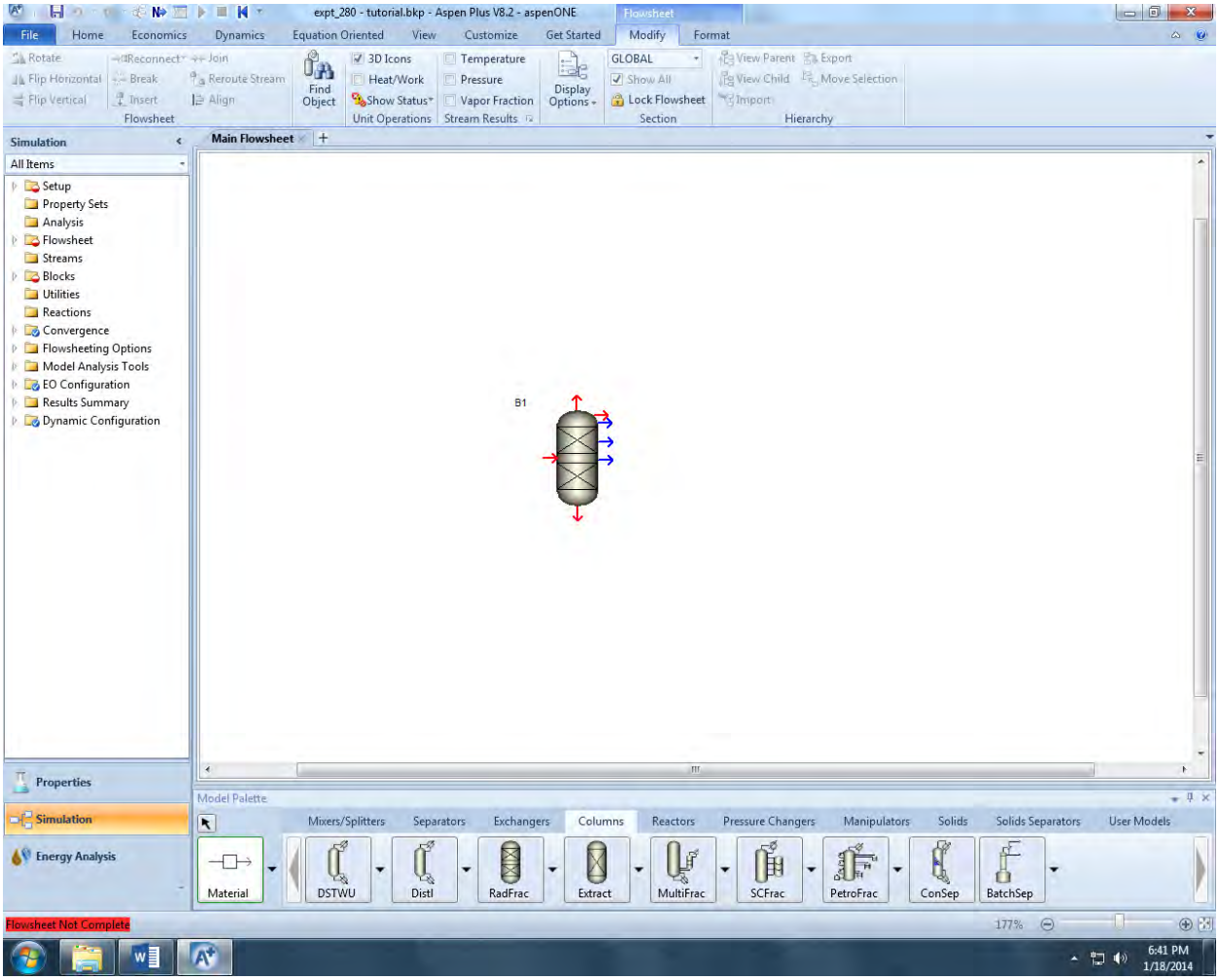
Select the icon for the packed absorber.

Paste it into the Main Flowsheet.



Next step:

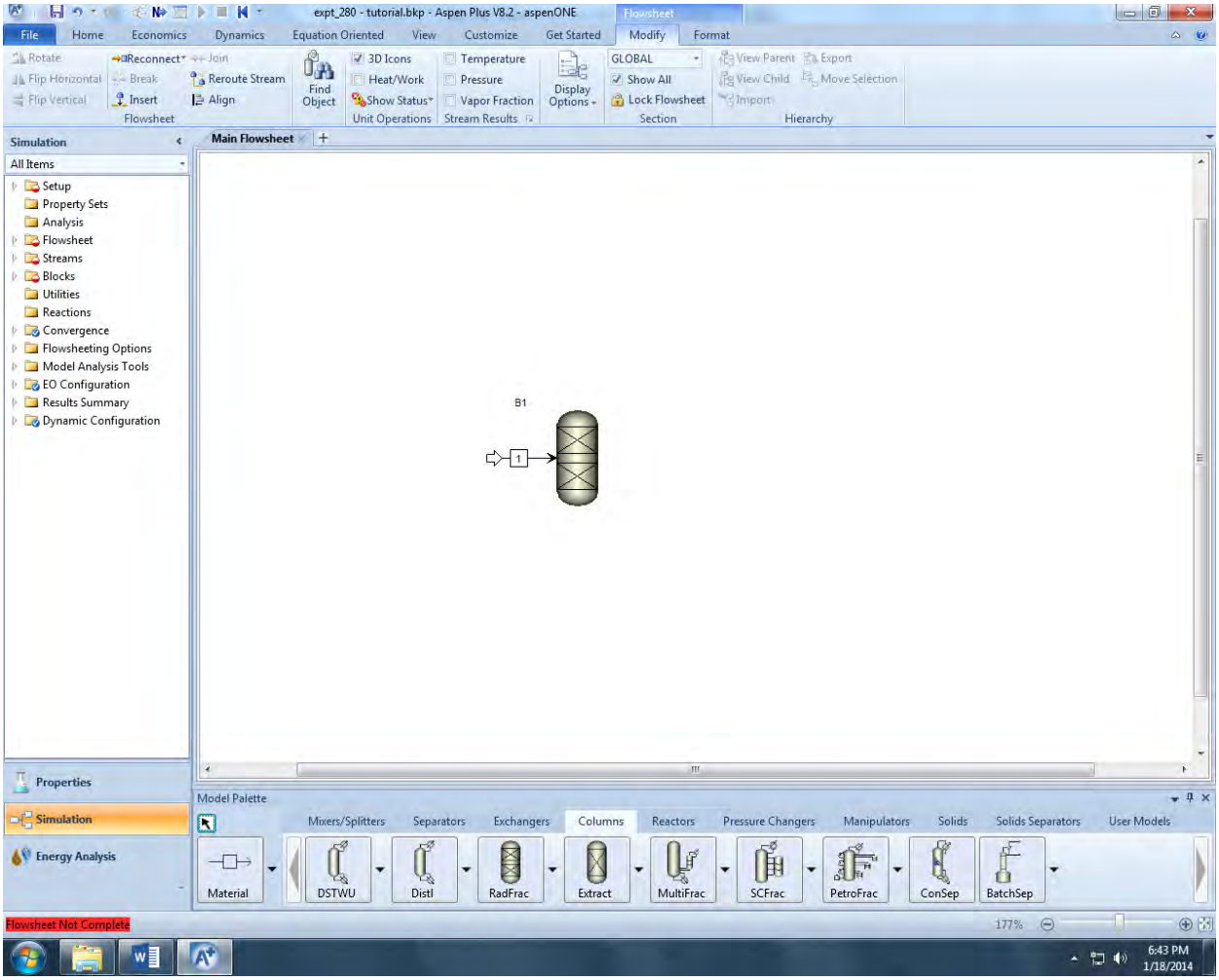
After clicking on the Material stream icon in the Model Palette, move the cursor to the Main Flowsheet.



Next step:

Add a stream for the gas inlet.

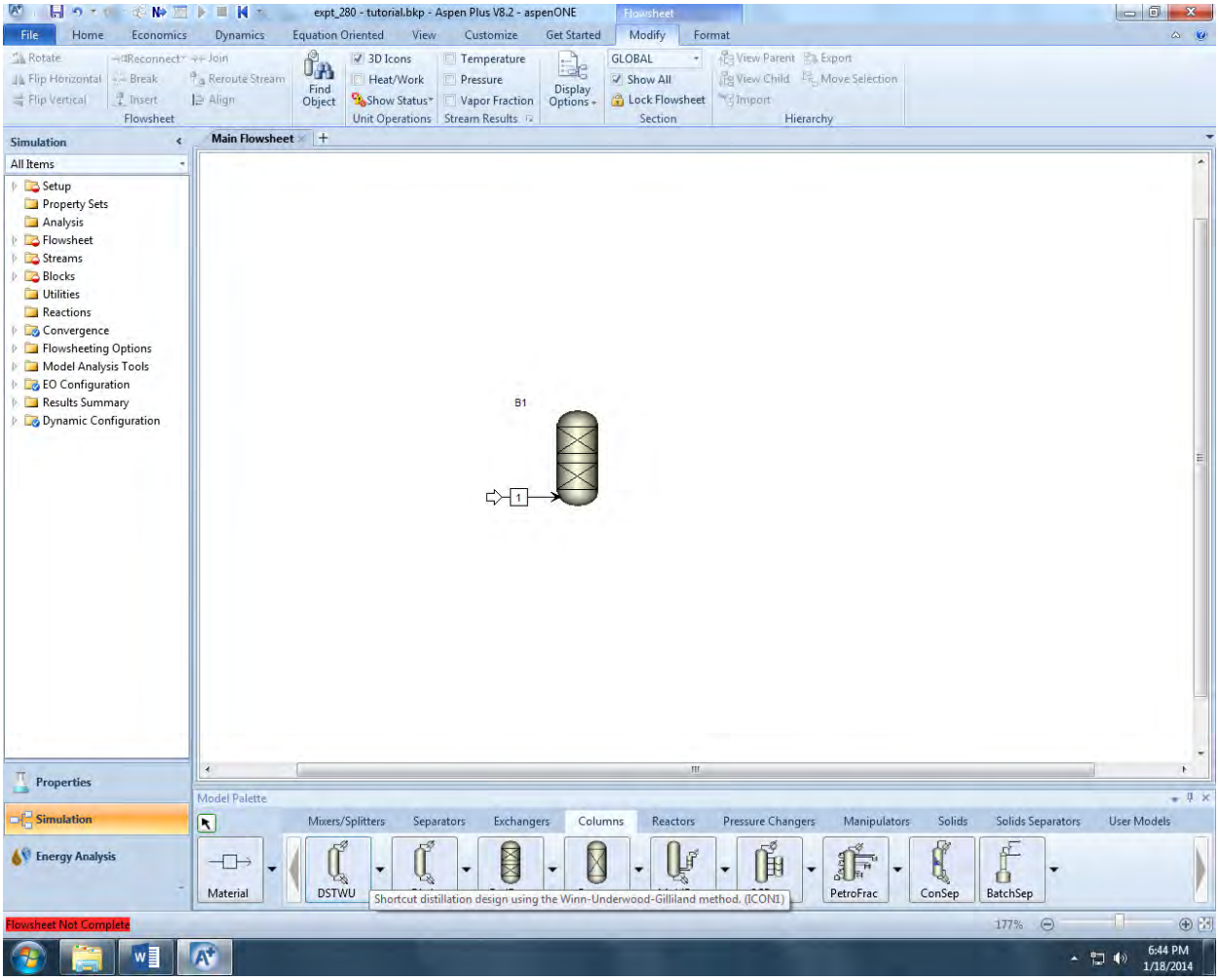
Connect the stream to the single feed arrow in the middle of the absorber icon.



Next step

Move the arrow on the absorber icon from the middle to the bottom.

Click on **Align** on the ribbon to straighten the line, if needed.



Next step:

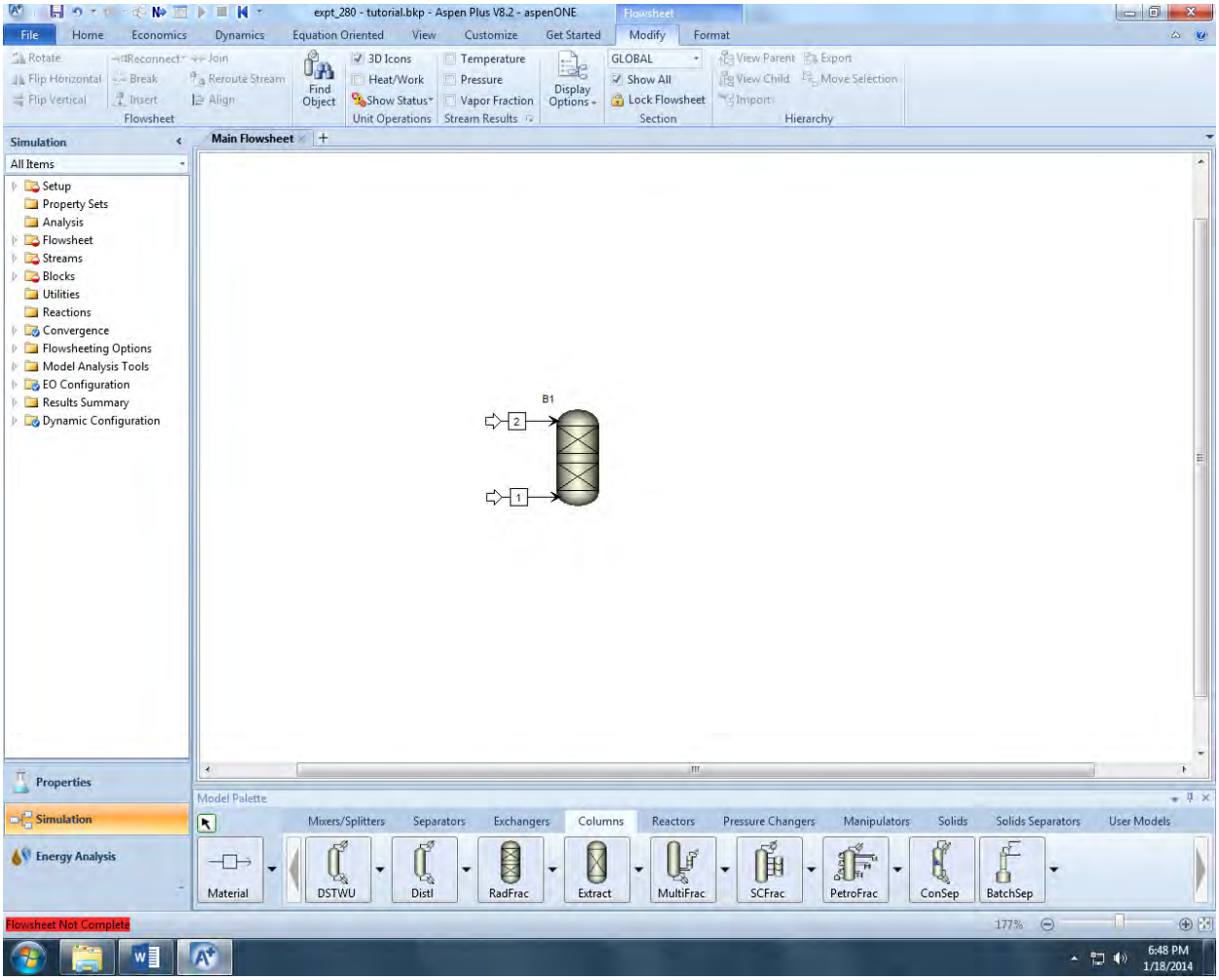
Add a stream for the liquid inlet.

A feed arrow will appear in the middle of the absorber icon.

Connect a stream to the feed arrow.

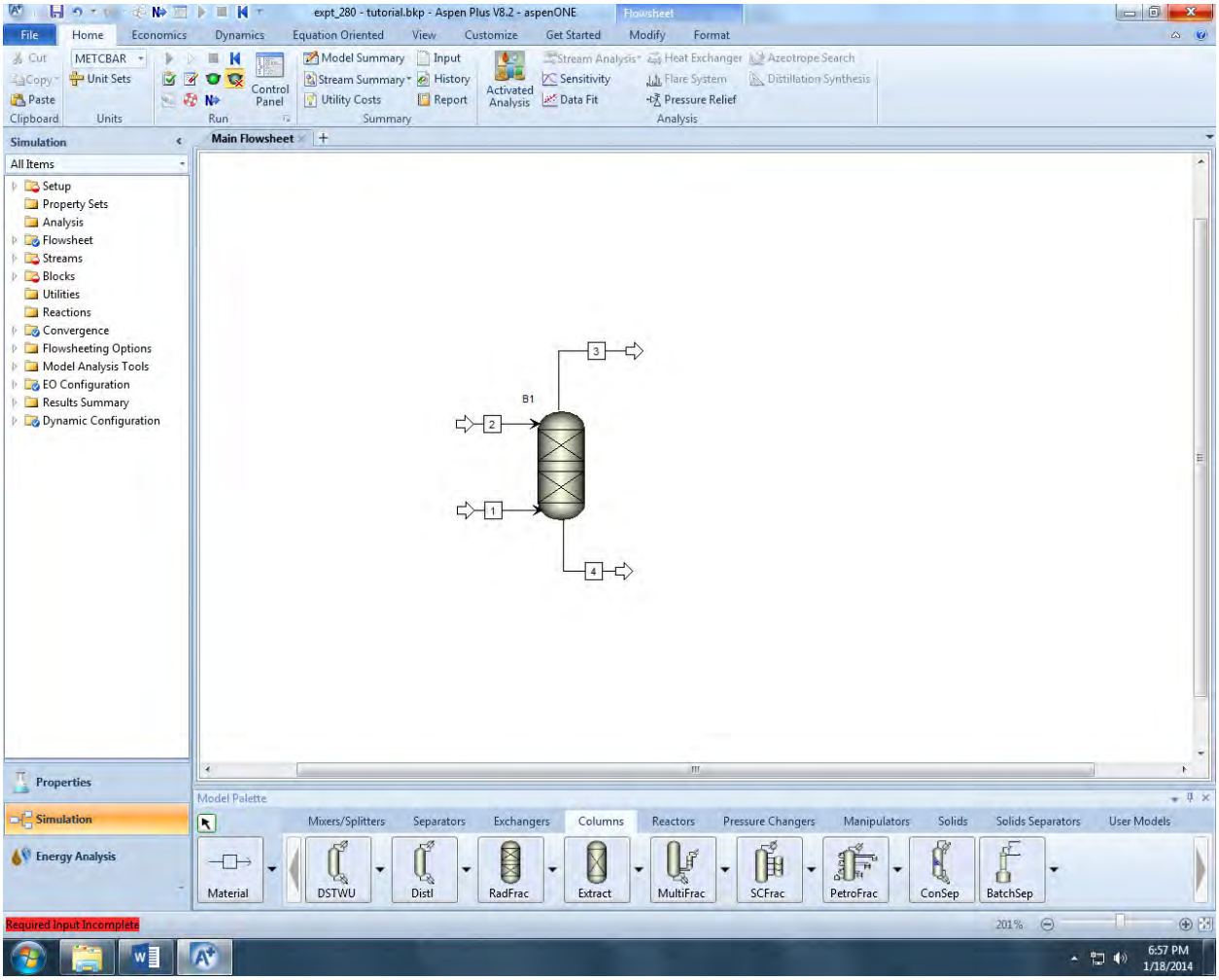
Then move it to the top of the absorber icon.

Click on **Align** on the ribbon to straighten the line, if needed.



Next step:

Add streams for the gas outlet and the liquid outlet.



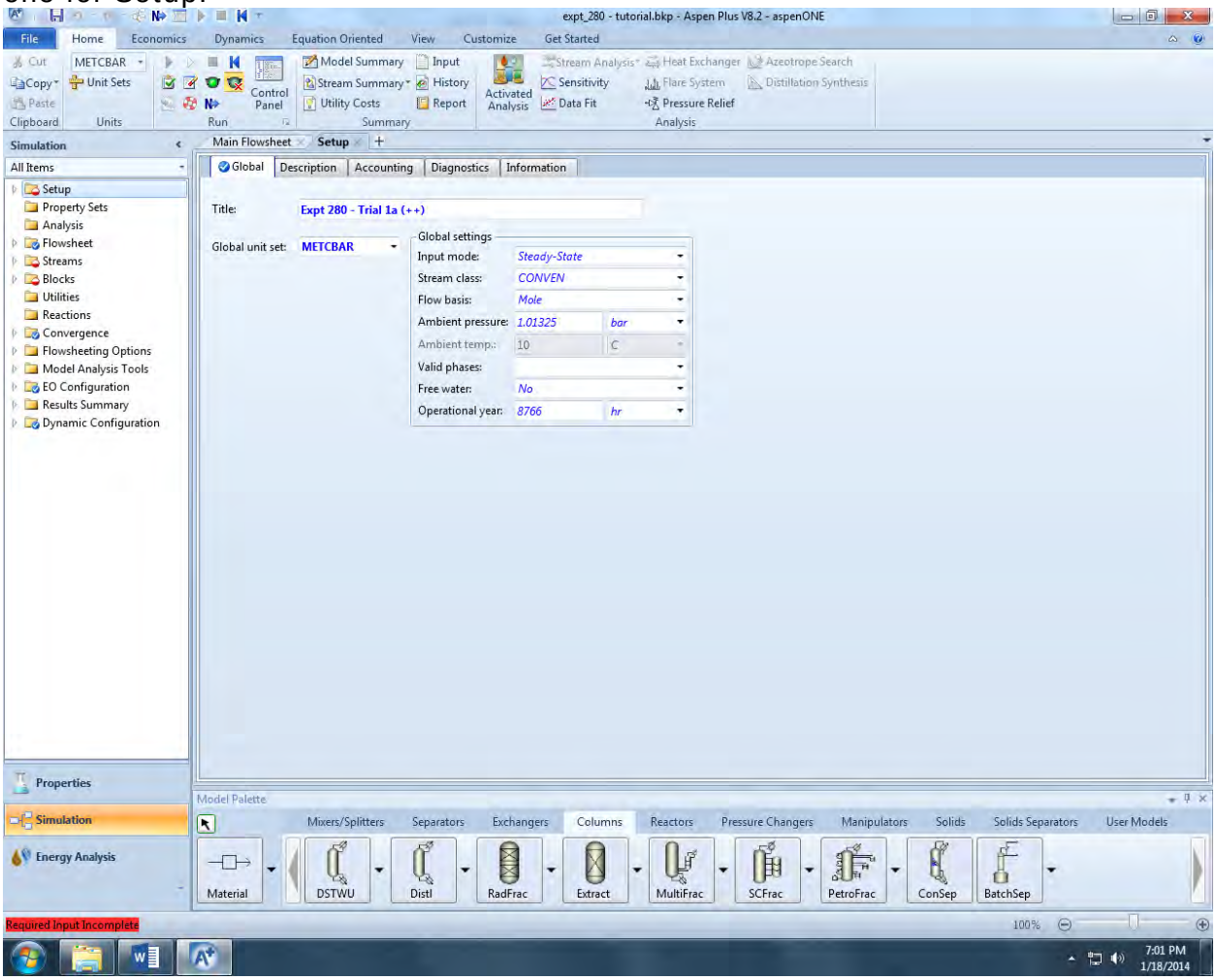
Press **Ctrl + S** to save your work.

☺ We have now completed specifying the flowsheet for the model.

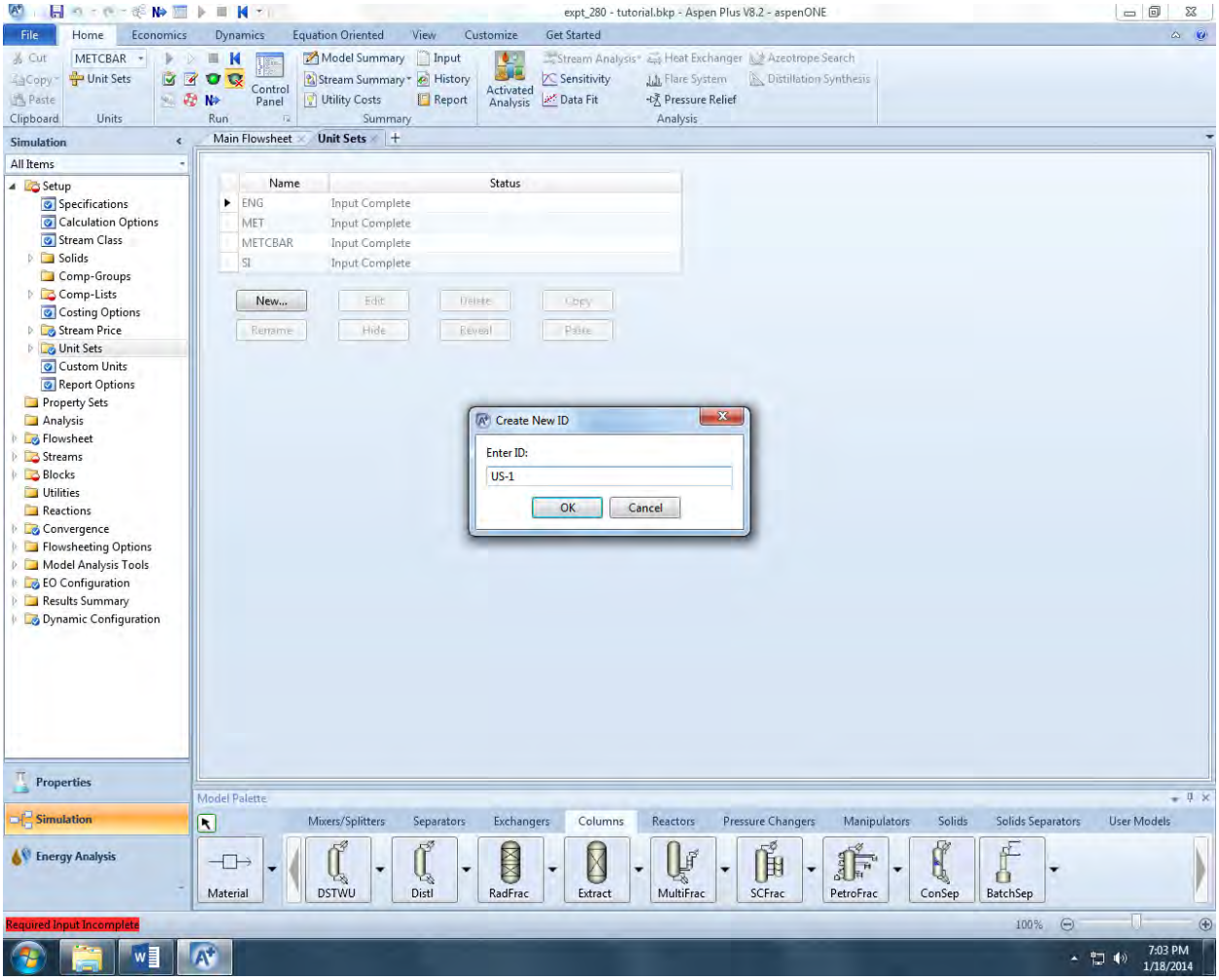
Next step:
Click on **Simulation** >> **Setup** in the Navigation Pane on the left side of the screen.

Enter the description **Expt 280 - Trial 1a (++)** in the Title box on the Global tab.

Note: In the main window, there are now two tabs, one for the Main Flowsheet and one for Setup.

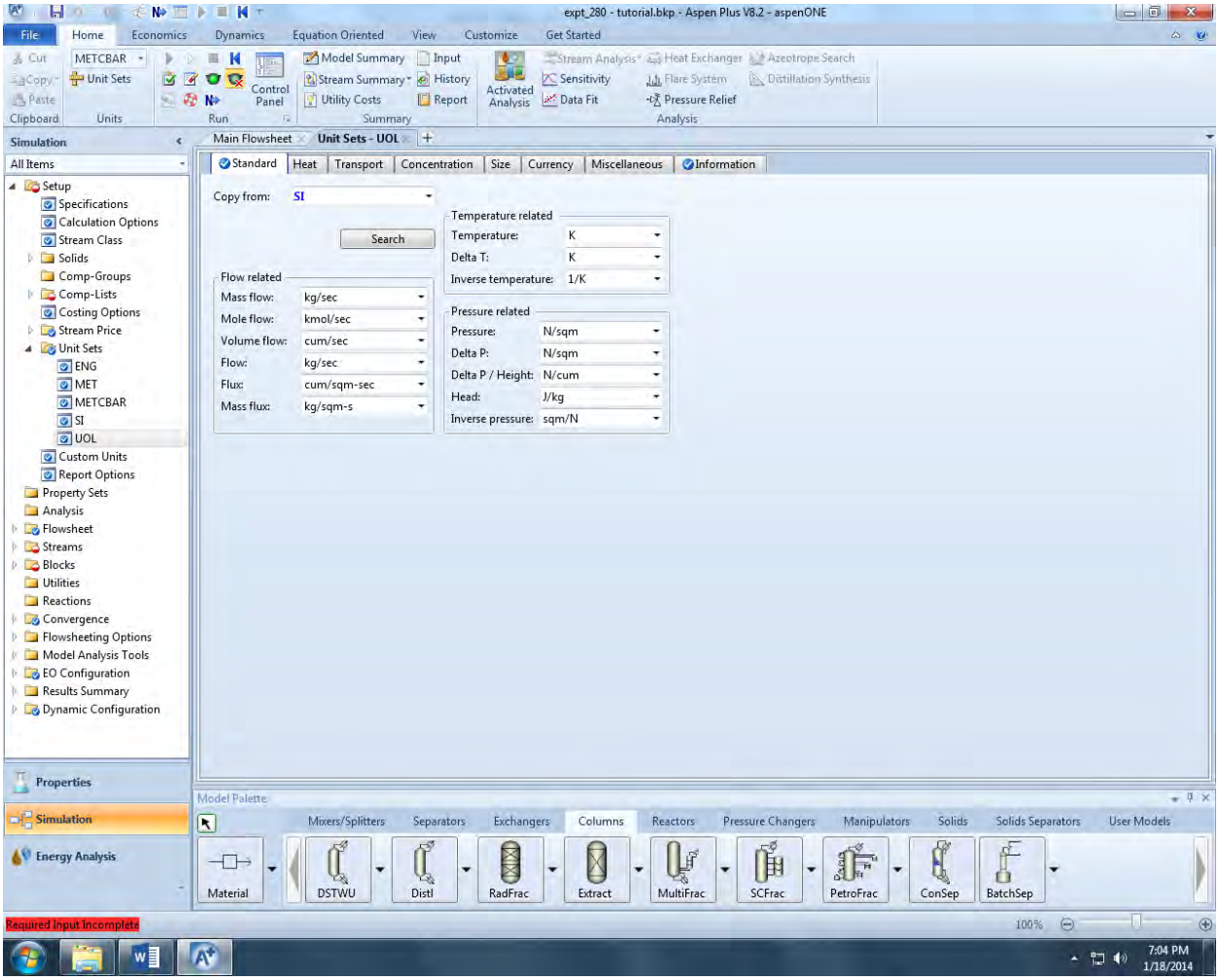


Next step:
Click on **Simulation** ≫ **Setup** ≫ **Unit Sets** in the Navigation Pane.
Then click on the **New** button.



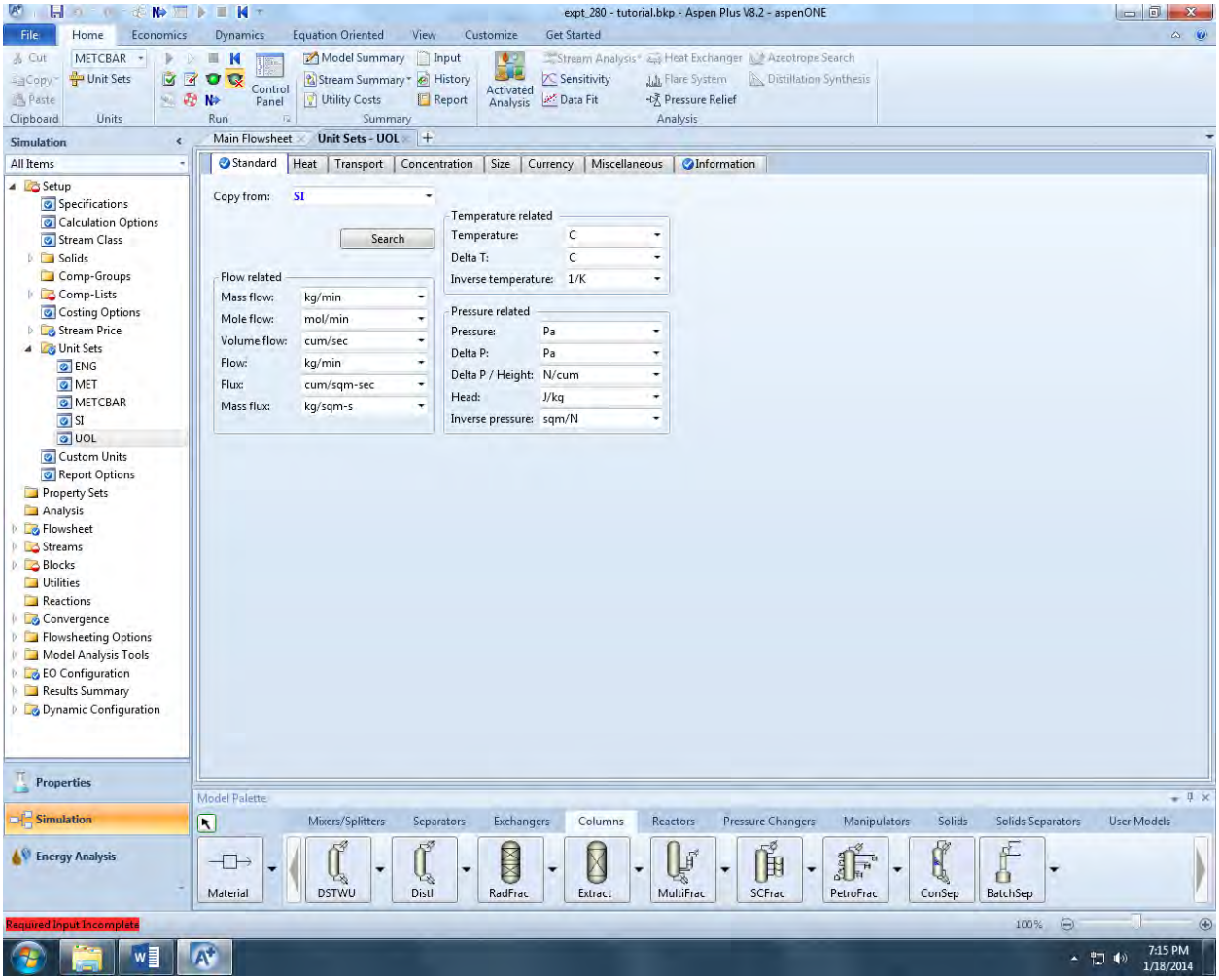
Next step:
Enter **UOL** as the ID for the user set of units.

Here UOL stands for Unit Operations Laboratory.
If you prefer a different ID, that's fine too!

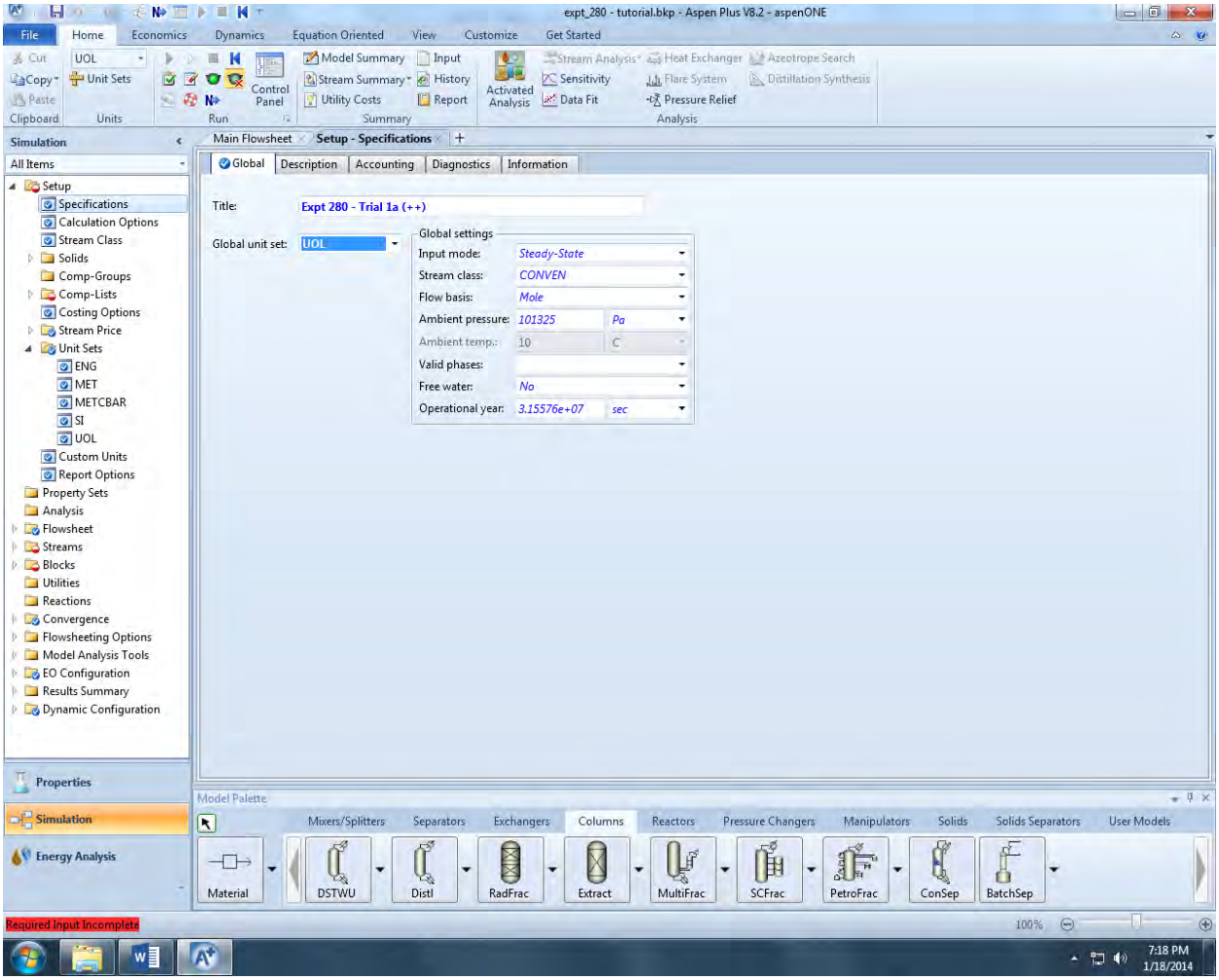


Next step:
Adjust the Aspen Plus® units to be friendly with the data set for this trial.

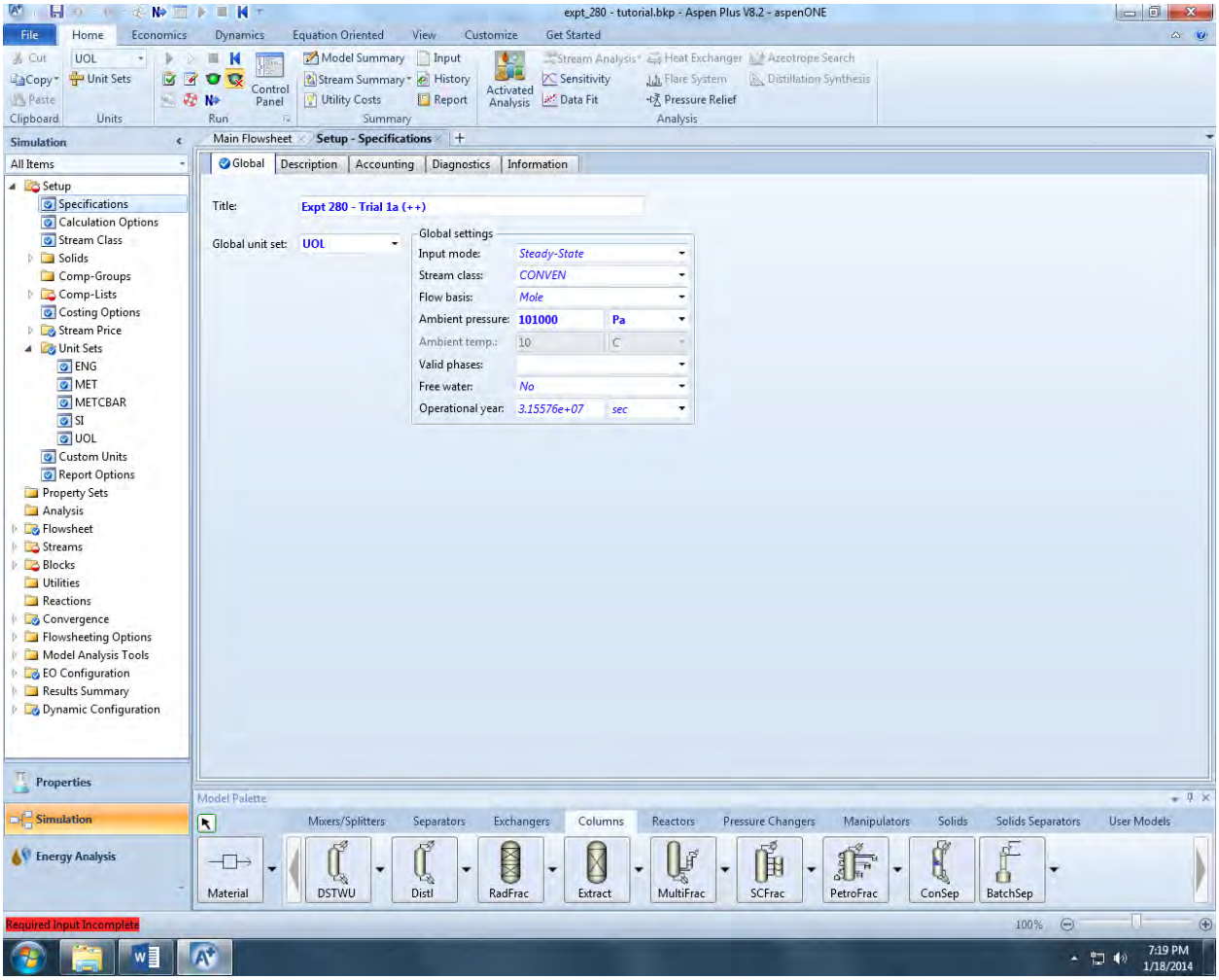
For example:
-- Mass flow: **kg/min**.
-- Mole flow: **mol/min**.
-- Flow: **kg/min**
-- Temperature: **C** (That's degrees Celsius, not coulombs!)
-- Delta T: **C**
-- Pressure: **Pa**
-- Delta P: **Pa**



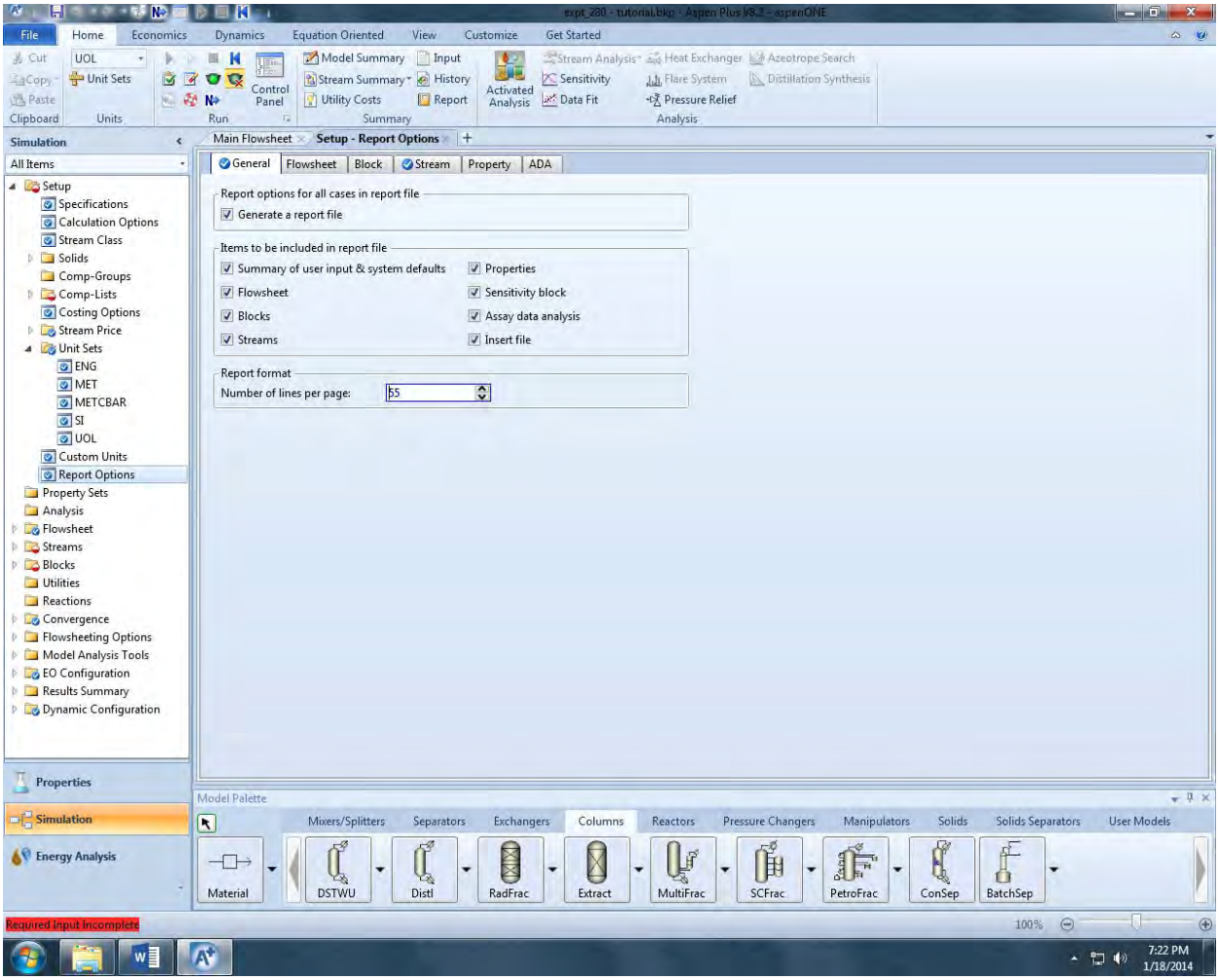
Next step:
Click on **Simulation** ≫ **Setup** ≫ **Specifications**.
Enter **UOL** set as the Global Unit Set on the Global tab.



Next step:
On the same page (**Simulation** ≫ **Setup** ≫ **Specifications**),
Adjust the value of the ambient pressure to 101,000 Pa, as given in the problem statement.

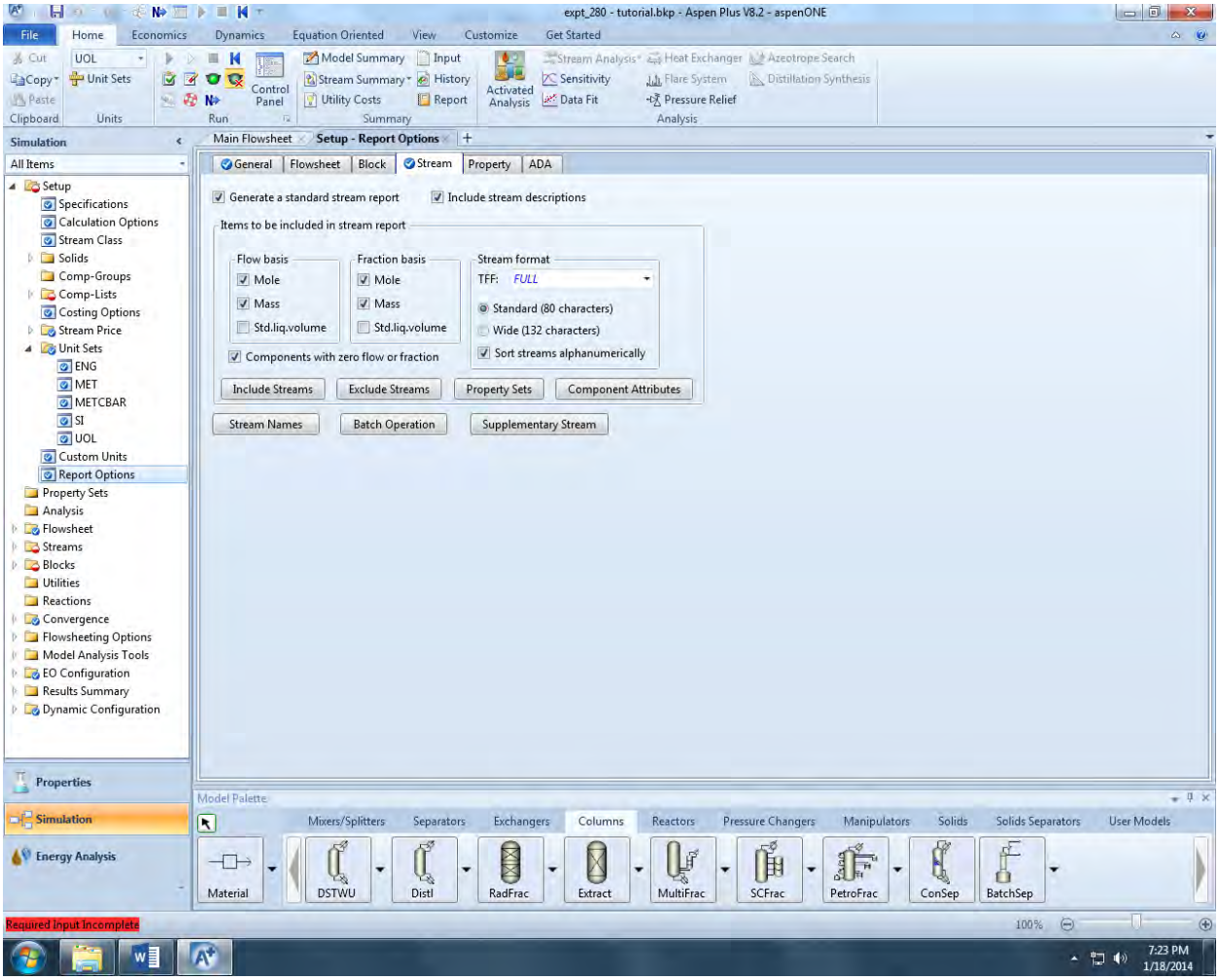


Next step:
Click on **Simulation** ≫ **Setup** ≫ **Report Options**.
Select all checkboxes in the General tab.
Set the number of lines per page to **55**.



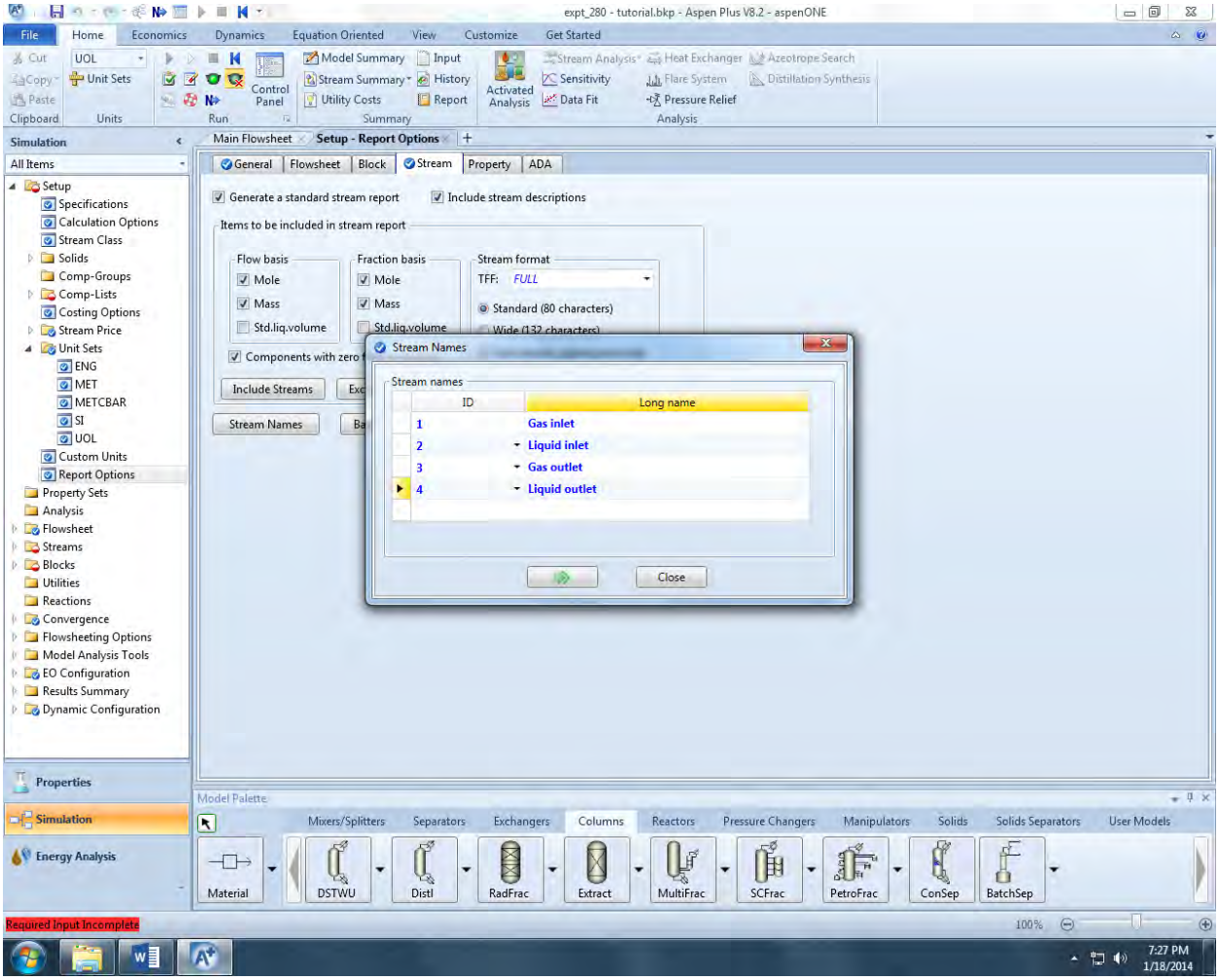
Next step:

On the **Stream** tab, select checkboxes for Mole and Mass for both the Flow basis and the Fraction basis.



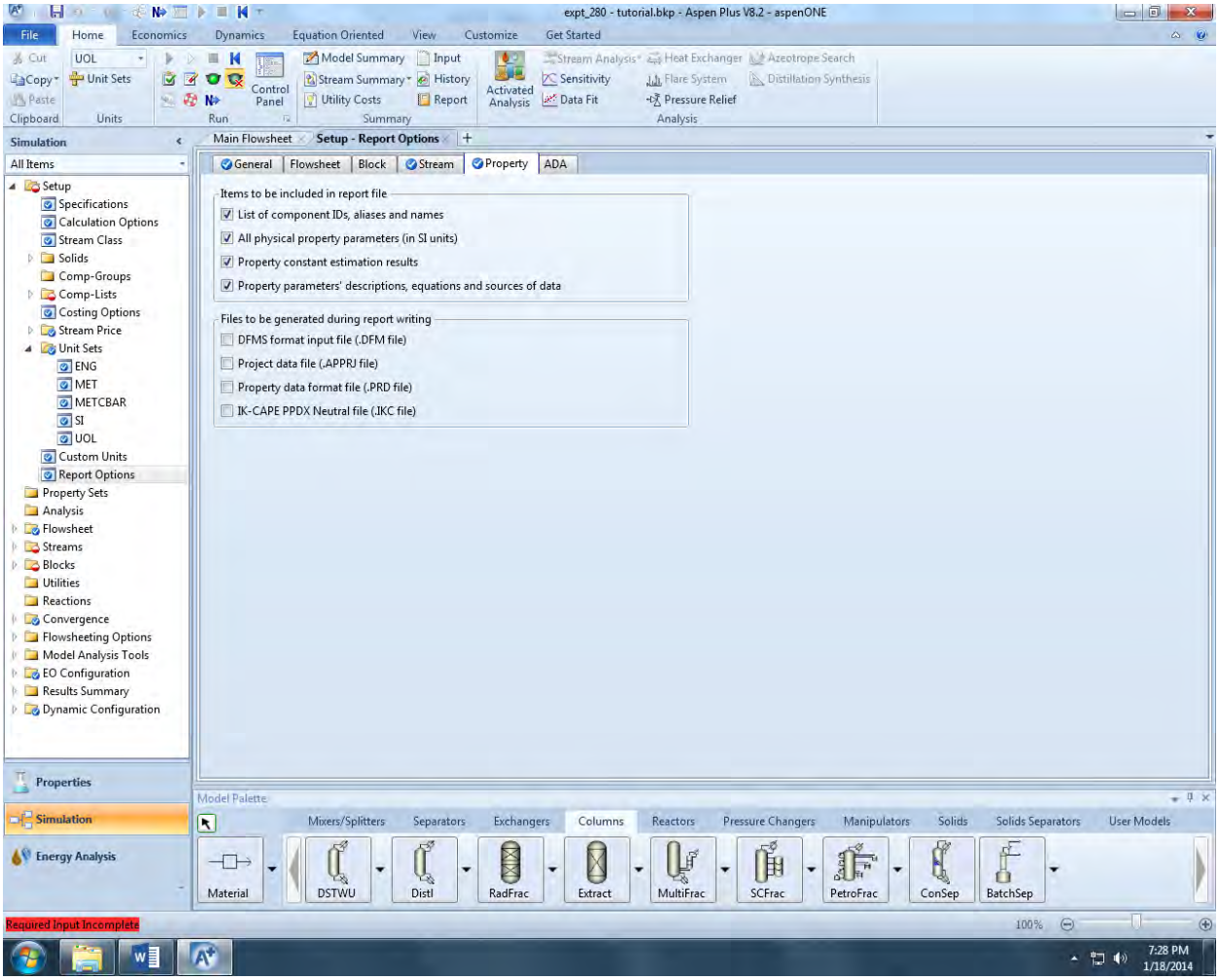
Next step:

Click on the button for Stream Names and enter a brief description corresponding to each stream number.



Next step:

On the **Property** tab, select the checkboxes for all the options to include in the report file.



Note

The above settings for the Report Options will produce a huge report (over fifty pages) for each trial. But don't worry! There will be no need to print out the entire report. Rather, the report file will be available for further study: (1) to define exactly the conditions of the simulation, (2) to deepen one's understanding of the calculation methodology, and (3) to troubleshoot the calculations.

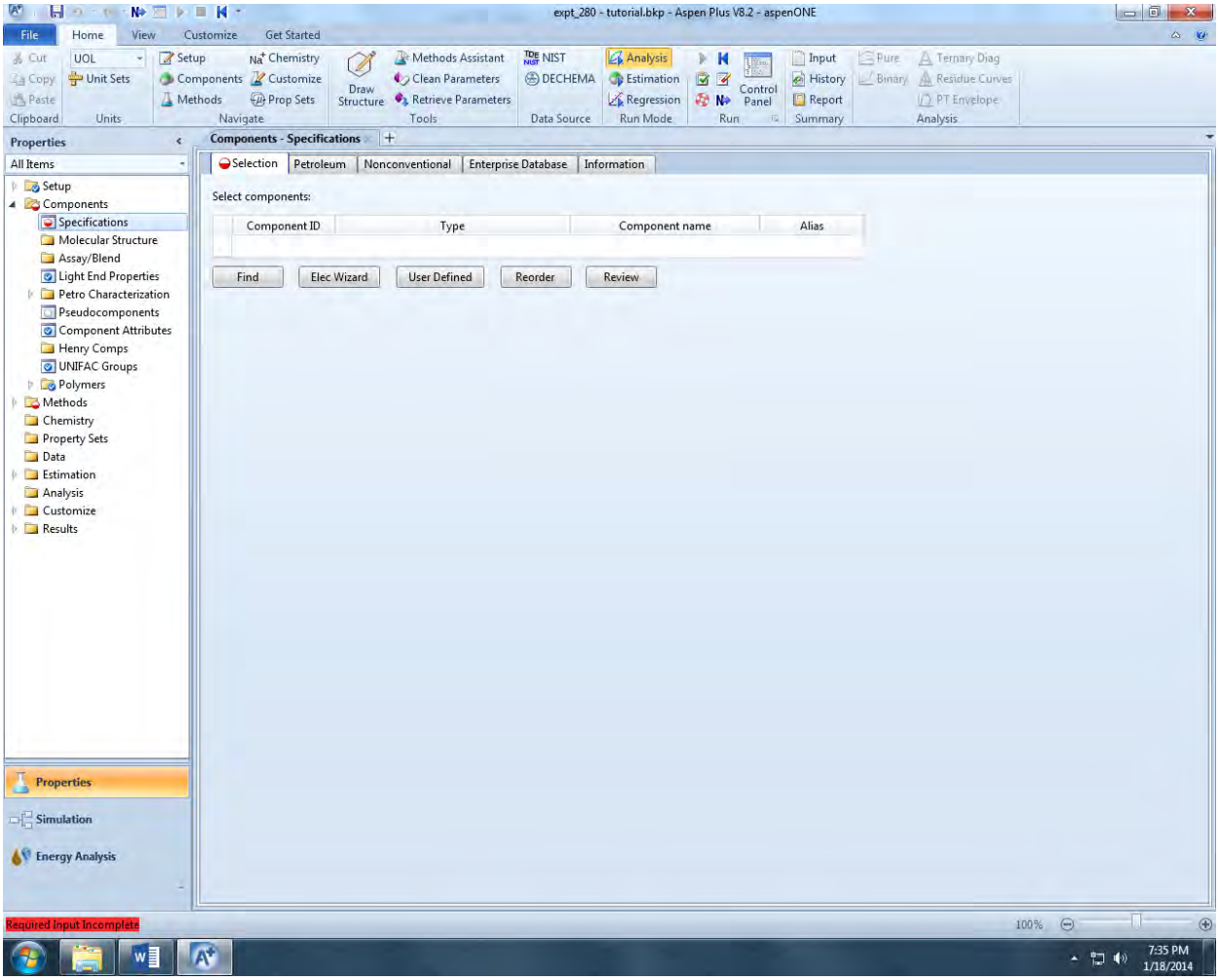
Press **Ctrl + S**.

☺ We have now completed setting up the basic administration of the model.

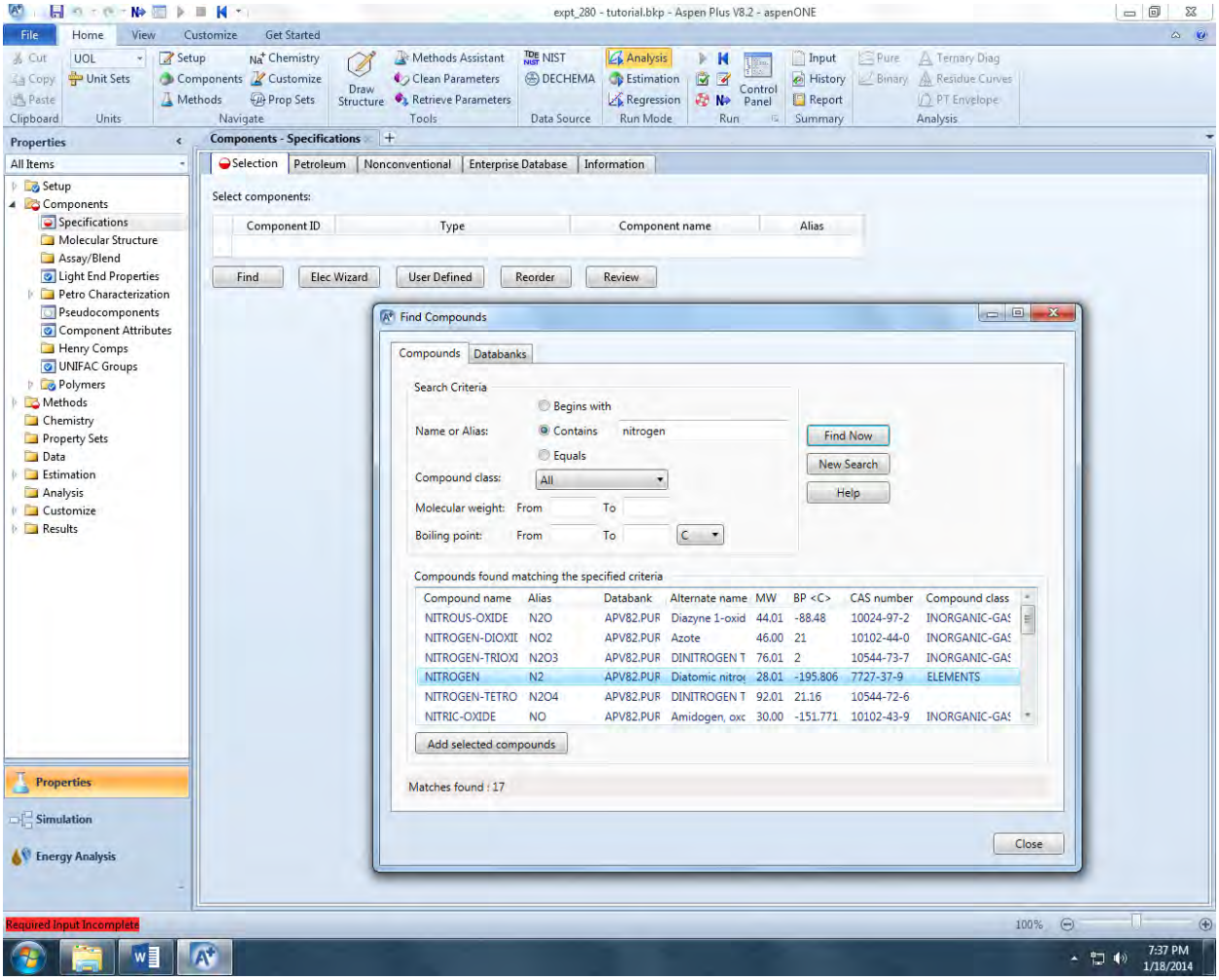
Next step:

Click on **Properties** at the bottom of the Navigation Pane.

Then click on **Properties** >> **Components** >> **Specifications**.

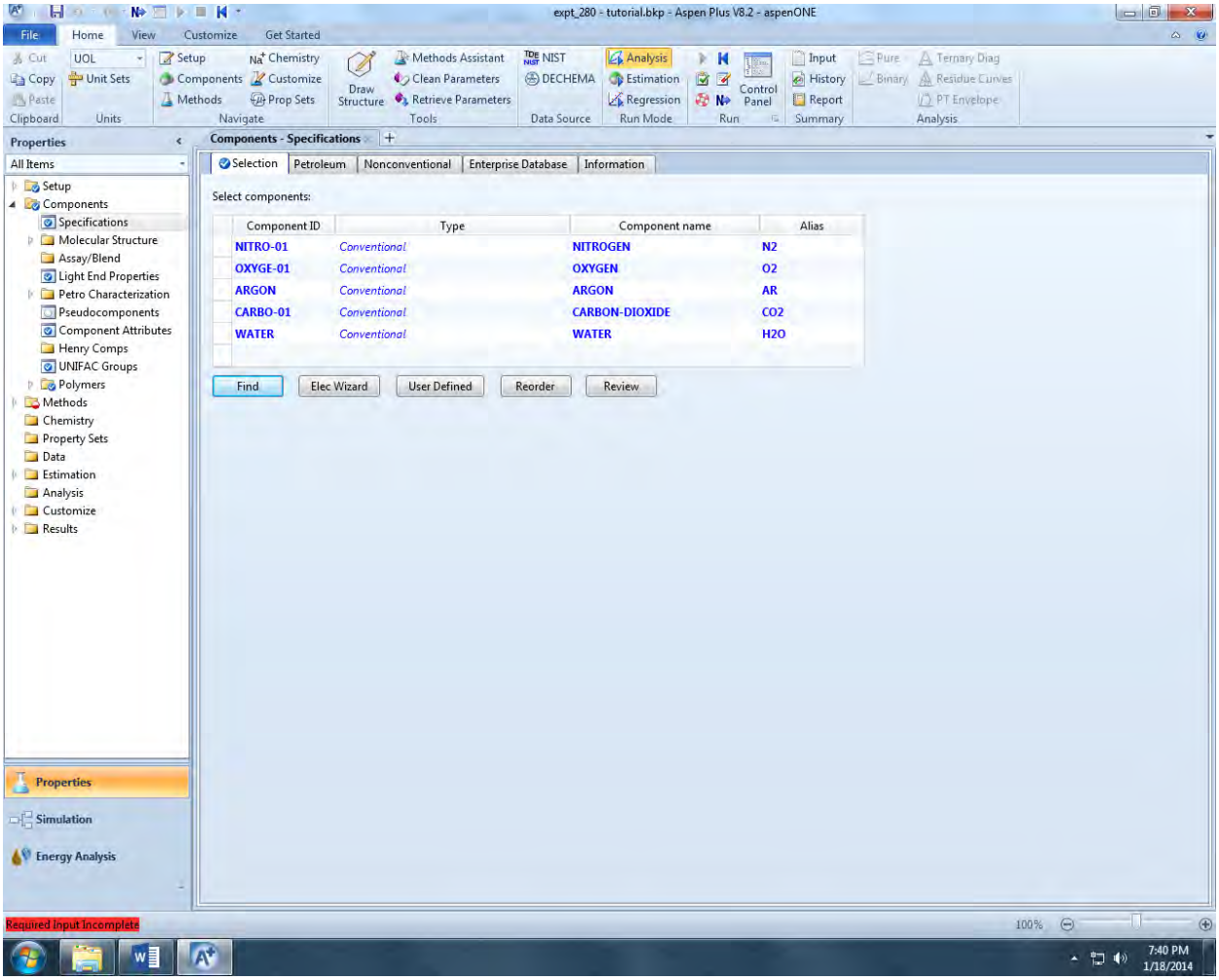


Next step:
Using the **Find** button in the Selection tab, search for nitrogen.

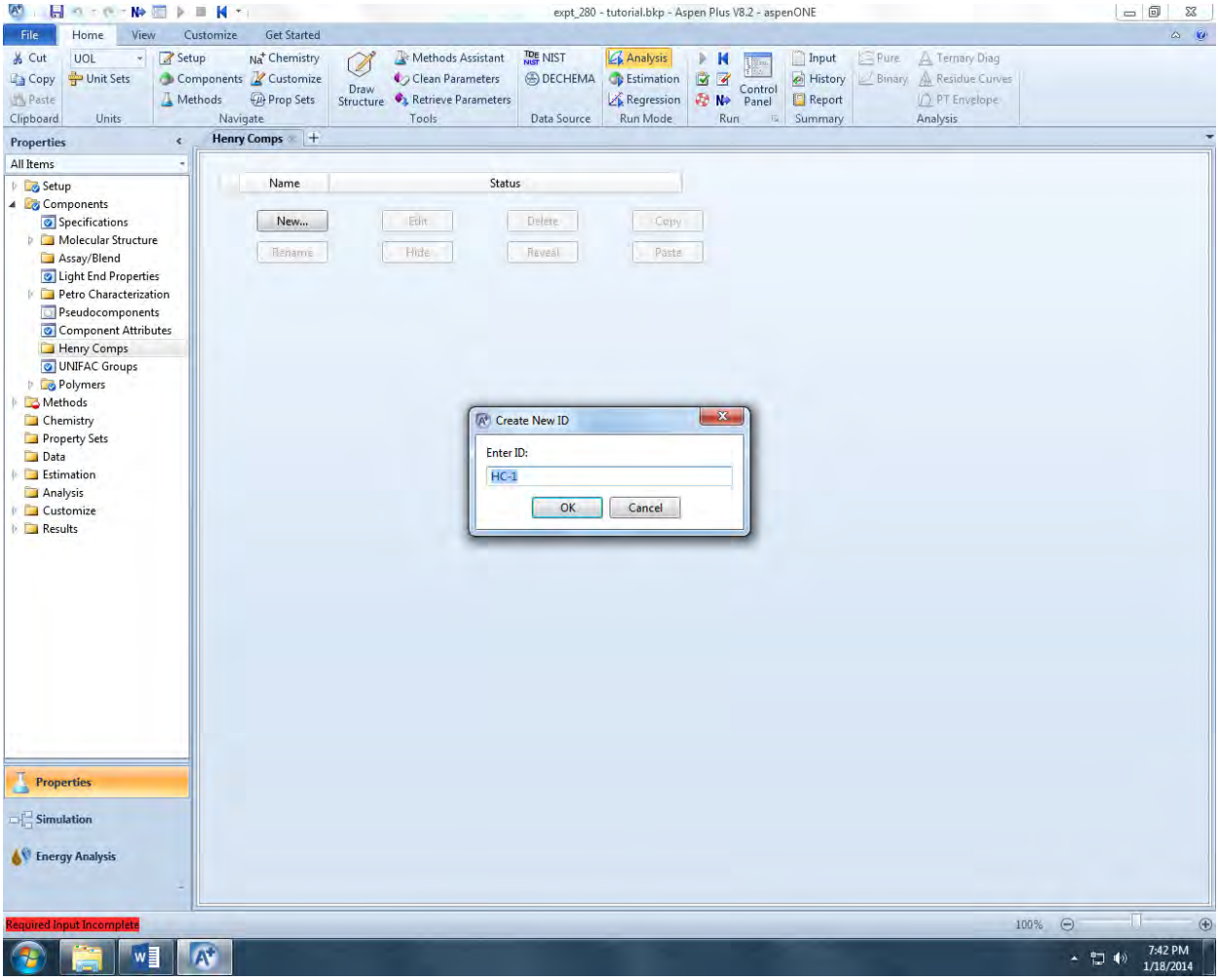


Next step:

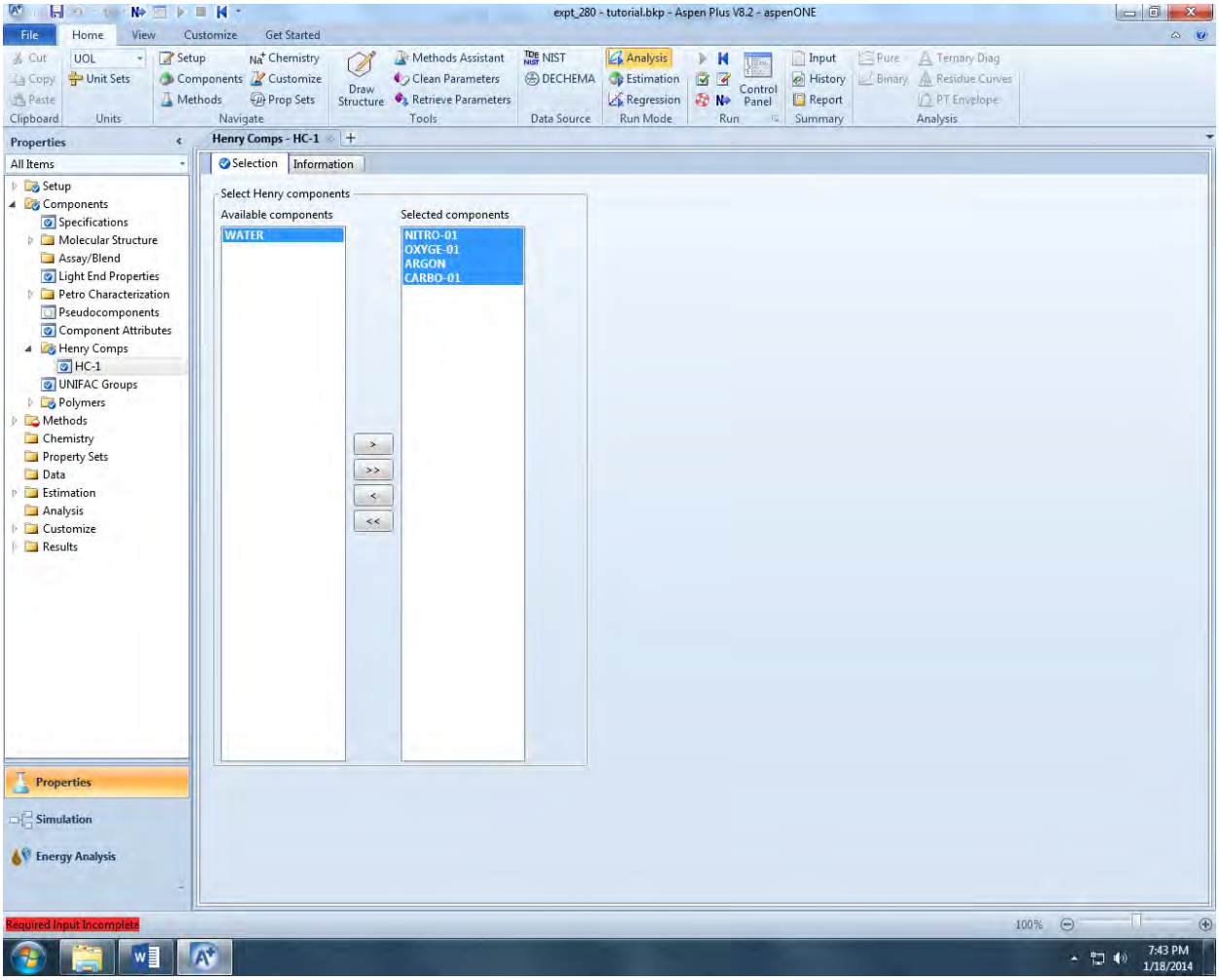
Click on NITROGEN in the list to add it to the model.
Then add oxygen, argon, carbon dioxide, and water.



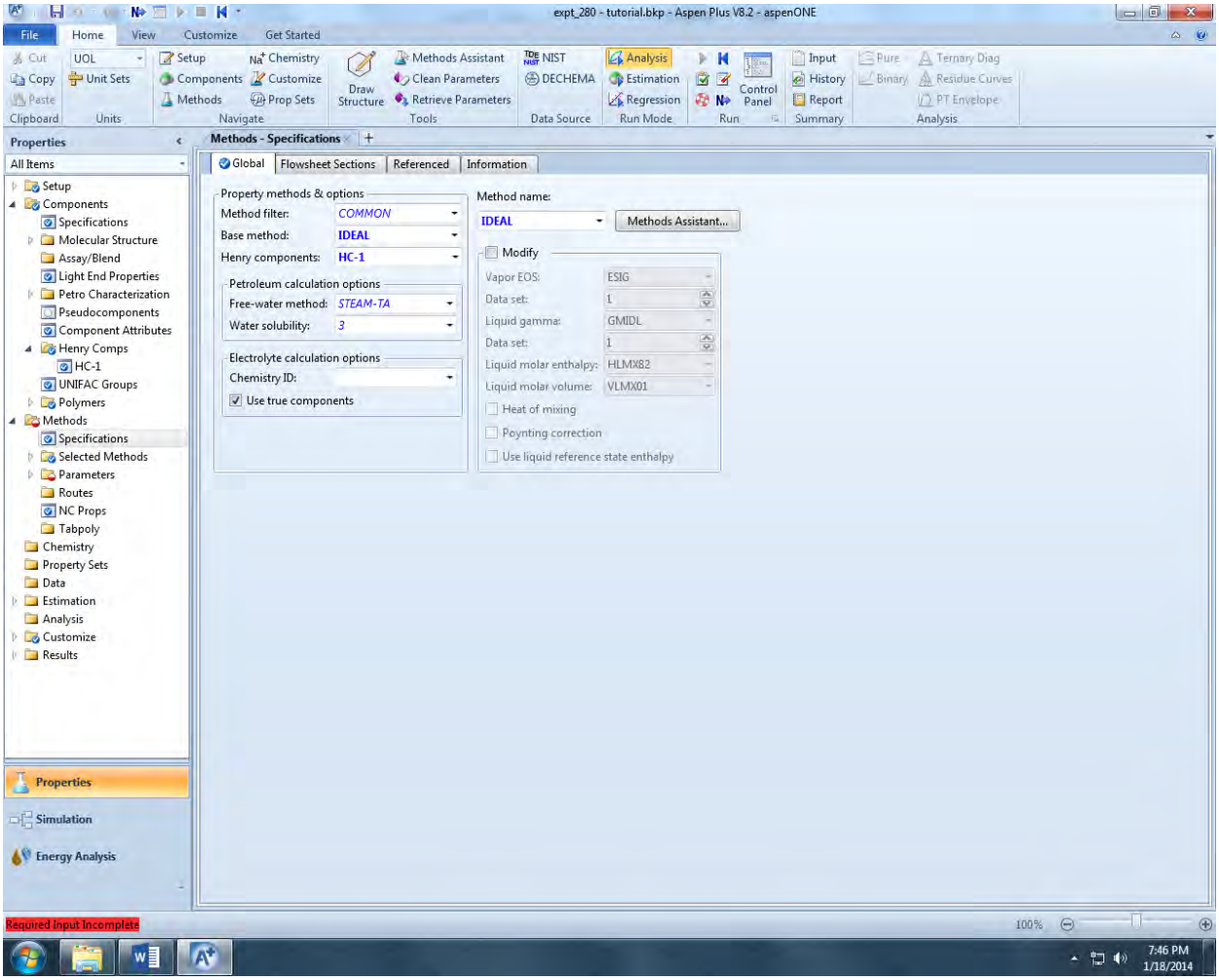
Next step:
Click on **Properties** ≫ **Components** ≫ **Henry Comps** in the Navigation Pane.
Click on the **New** button to create a set of components modeled by Henry's Law.



Next step:
Click **OK**.
Then select nitrogen, oxygen, argon, and carbon dioxide.

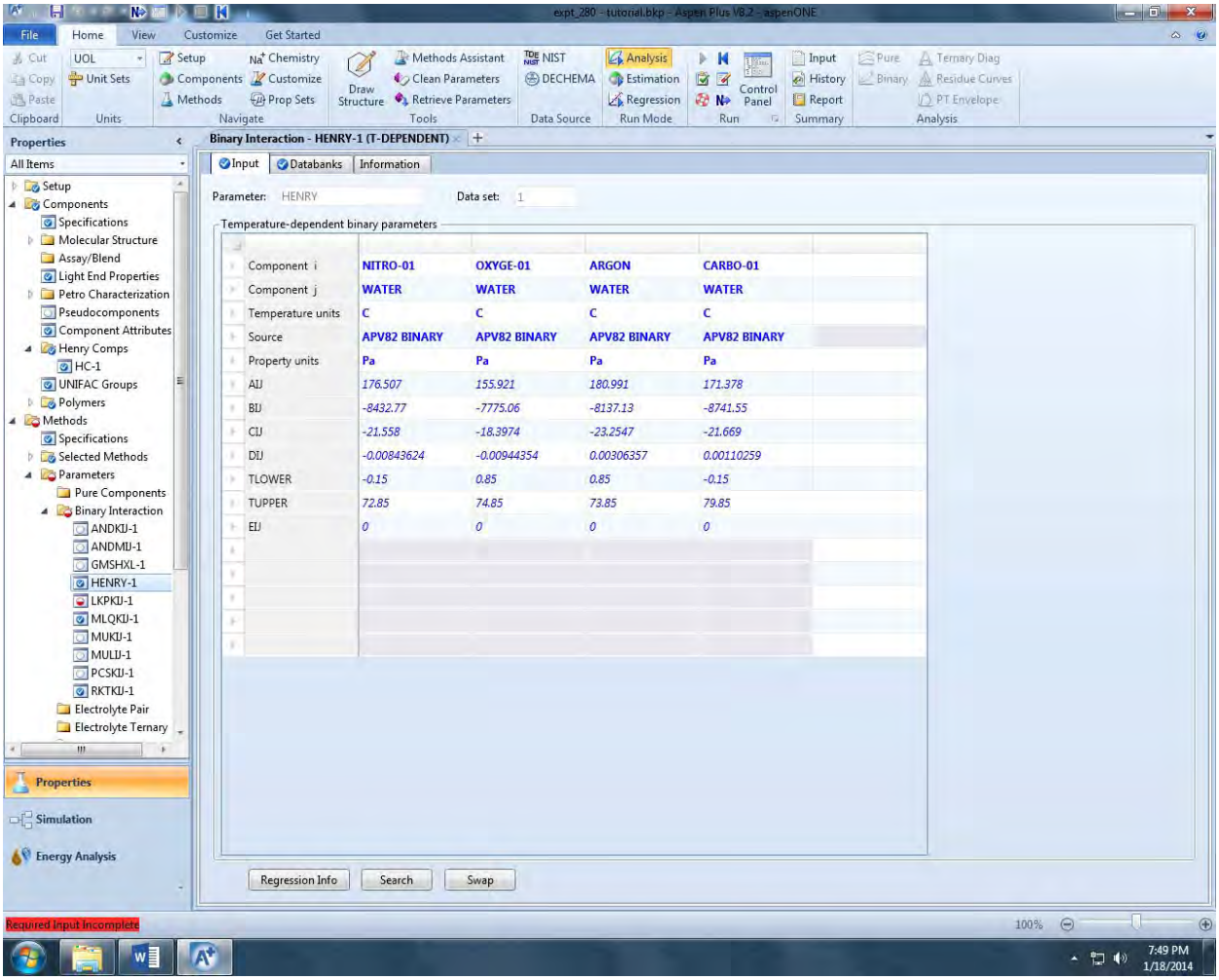


Next step:
Click on **Properties** ≫ **Methods** ≫ **Specifications** in the Navigation Pane.
On the Global tab:
Enter **IDEAL** for the base method and method name.
Enter **HC-1** for Henry Components.



We notice under Methods that the folder for Parameters has a red icon.

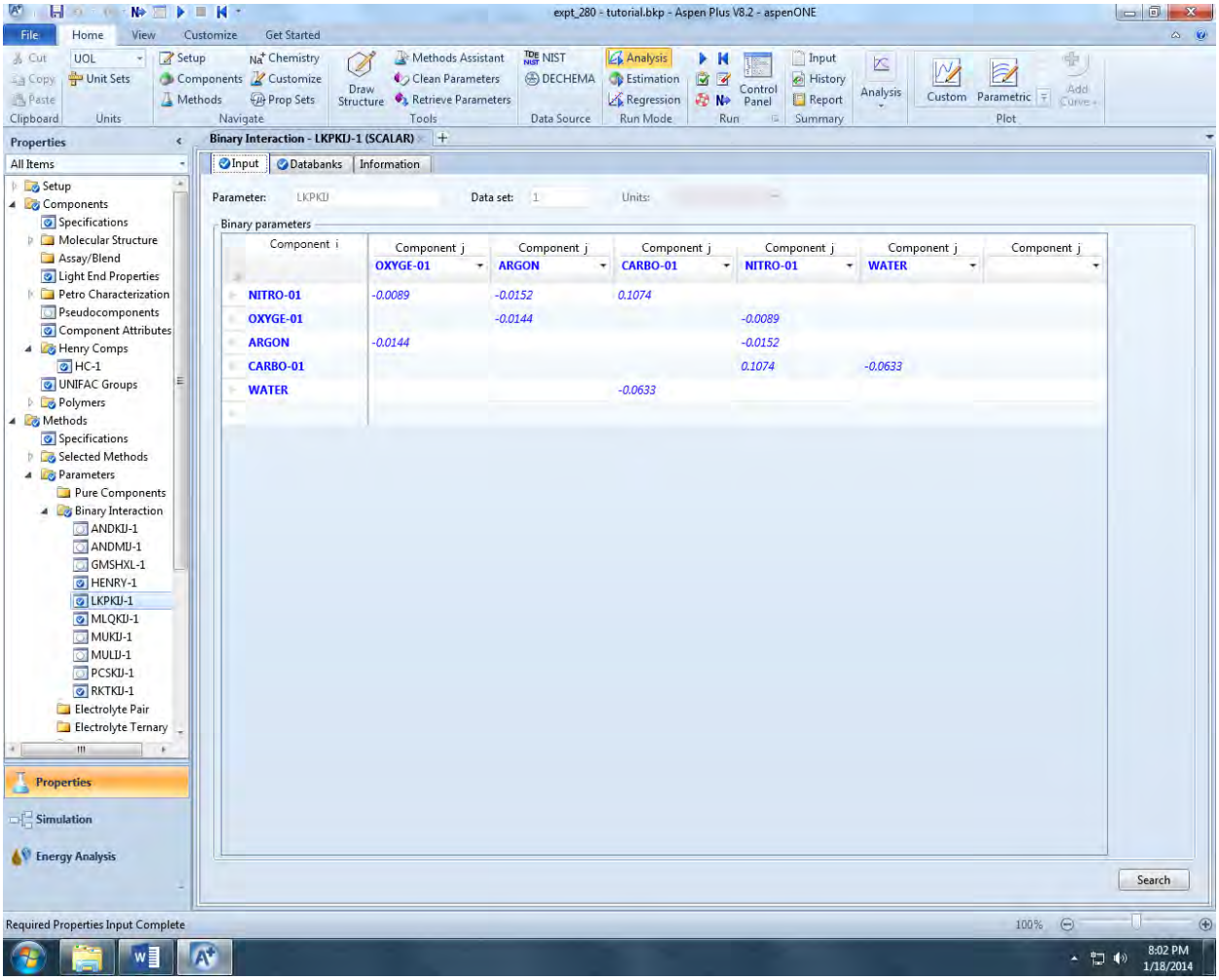
Next step:
Click **Properties** ≫ **Methods** ≫ **Parameters** ≫ **Binary Interaction** ≫ **HENRY-1**.
Inspect the chart to confirm that parameters are available for all four components.



In the Navigation Pane, The icon for the HENRY-1 branch has changed from red to blue.

But the LKPKIJ-1 icon is still red.

Click **Properties** » **Methods** » **Parameters** » **Binary Interaction** » **LKPKIJ-1**.



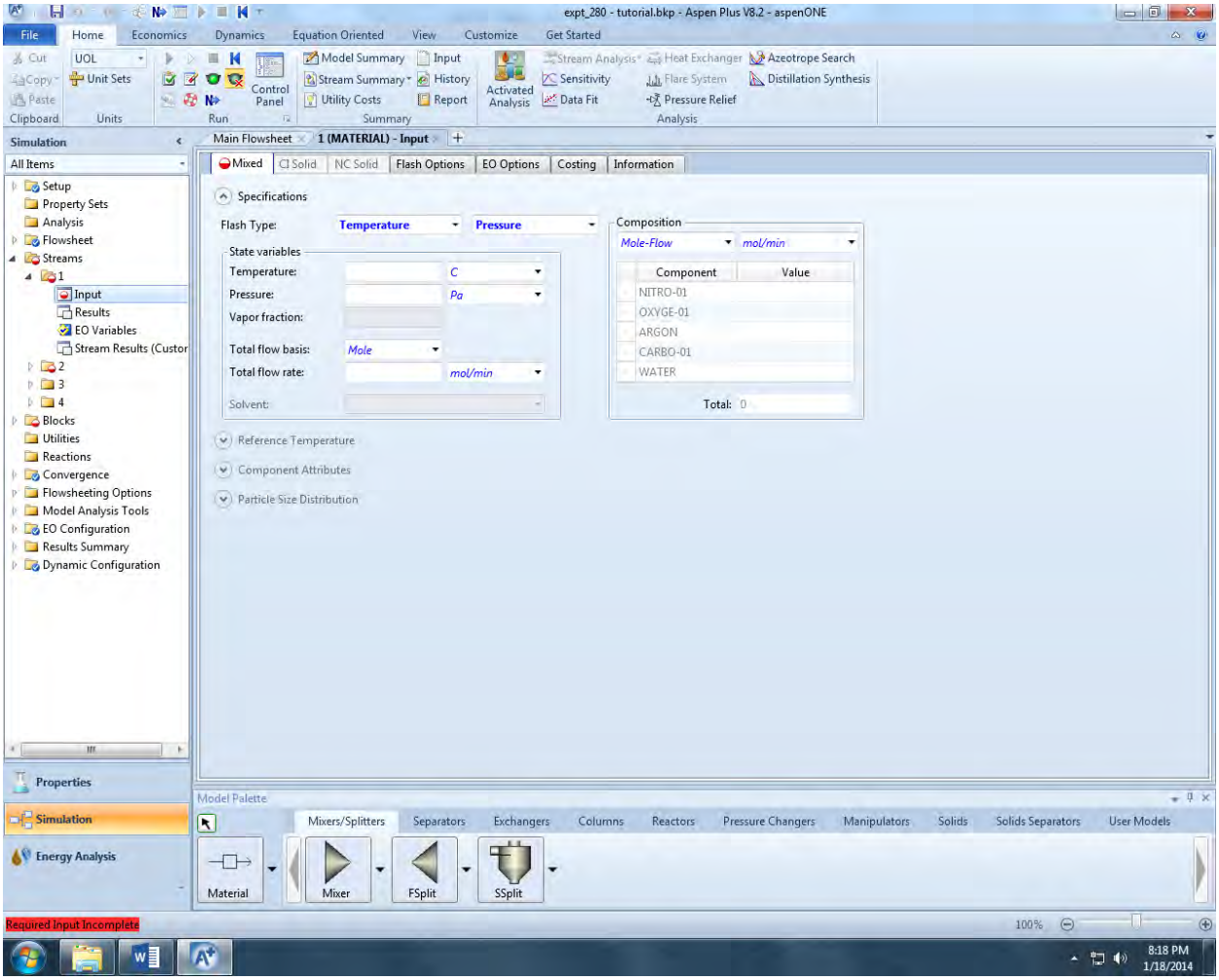
In the Navigation Pane, the icon for the LKPIJ-1 branch has changed from red to blue.

Press **Ctrl + S**.

☺ We have now completed specifying up the physical property models.

Next step:
Return to the **Simulation** in the Navigation Pane.
Click on **Simulation** ≫ **Streams** ≫ **1** ≫ **Input**.

Note: The numeral 1 refers to the stream number on the flow sheet. The data entry here defines it as the gas inlet.



Next step:

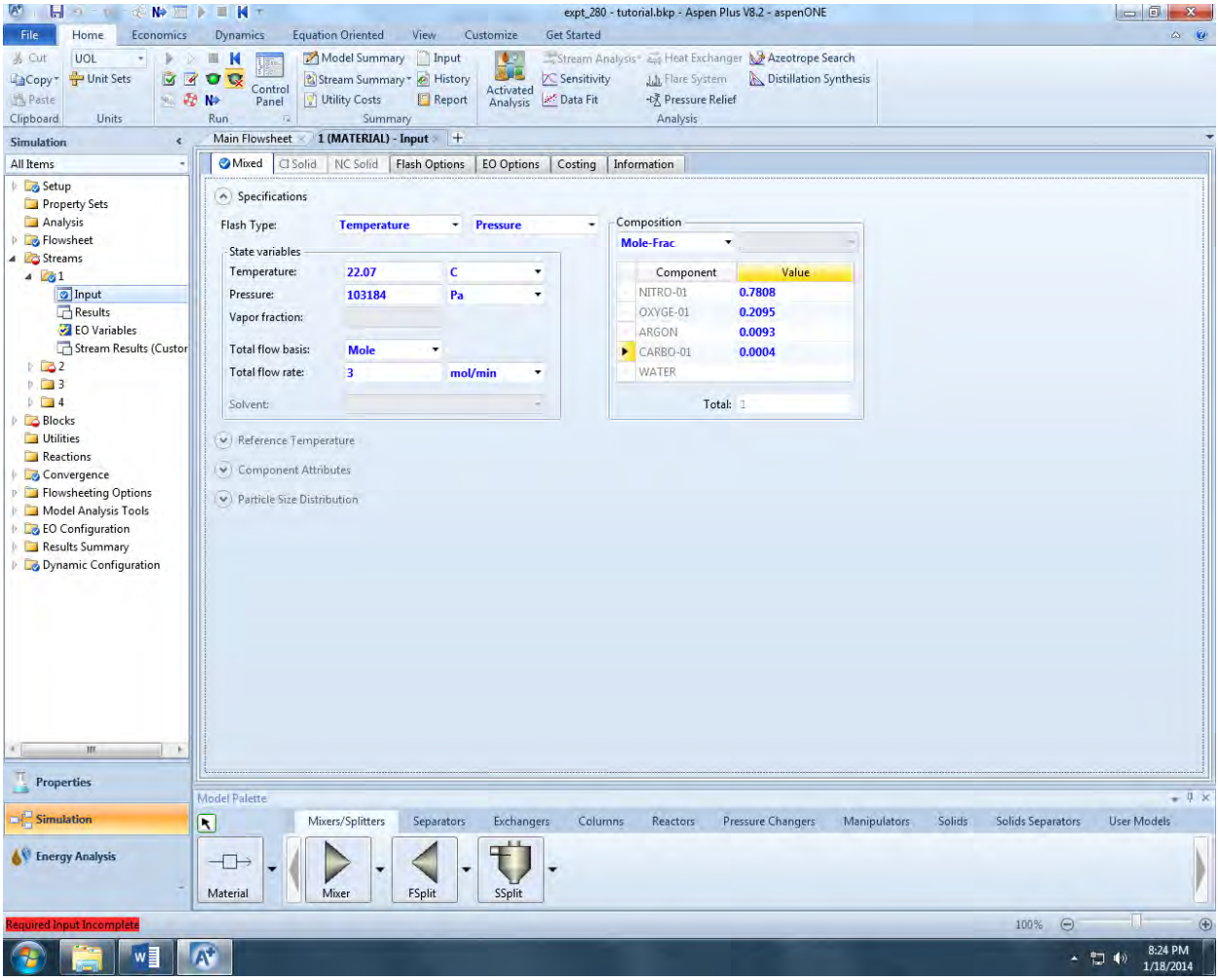
Consult the problem statement for the gas inlet stream and enter the appropriate values for:

-- temperature

-- pressure

-- total flow rate

-- and composition.



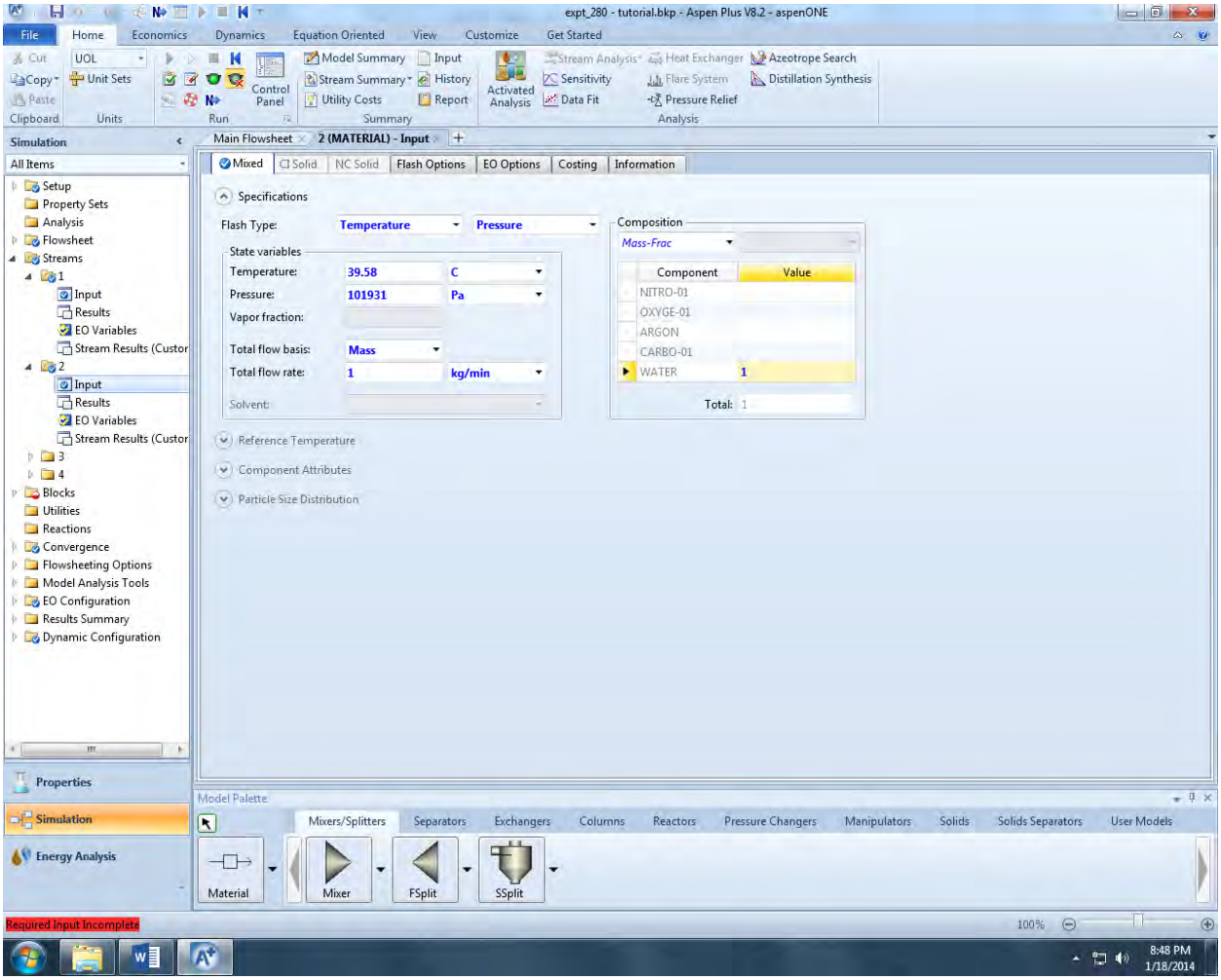
Avoid the common error of forgetting to specifically set the unit of Composition in the above screen. The default unit may be unsuitable for your particular problem.

Here, the unit of Composition has been set to Mole-Frac, consistent with the values in the problem statement.

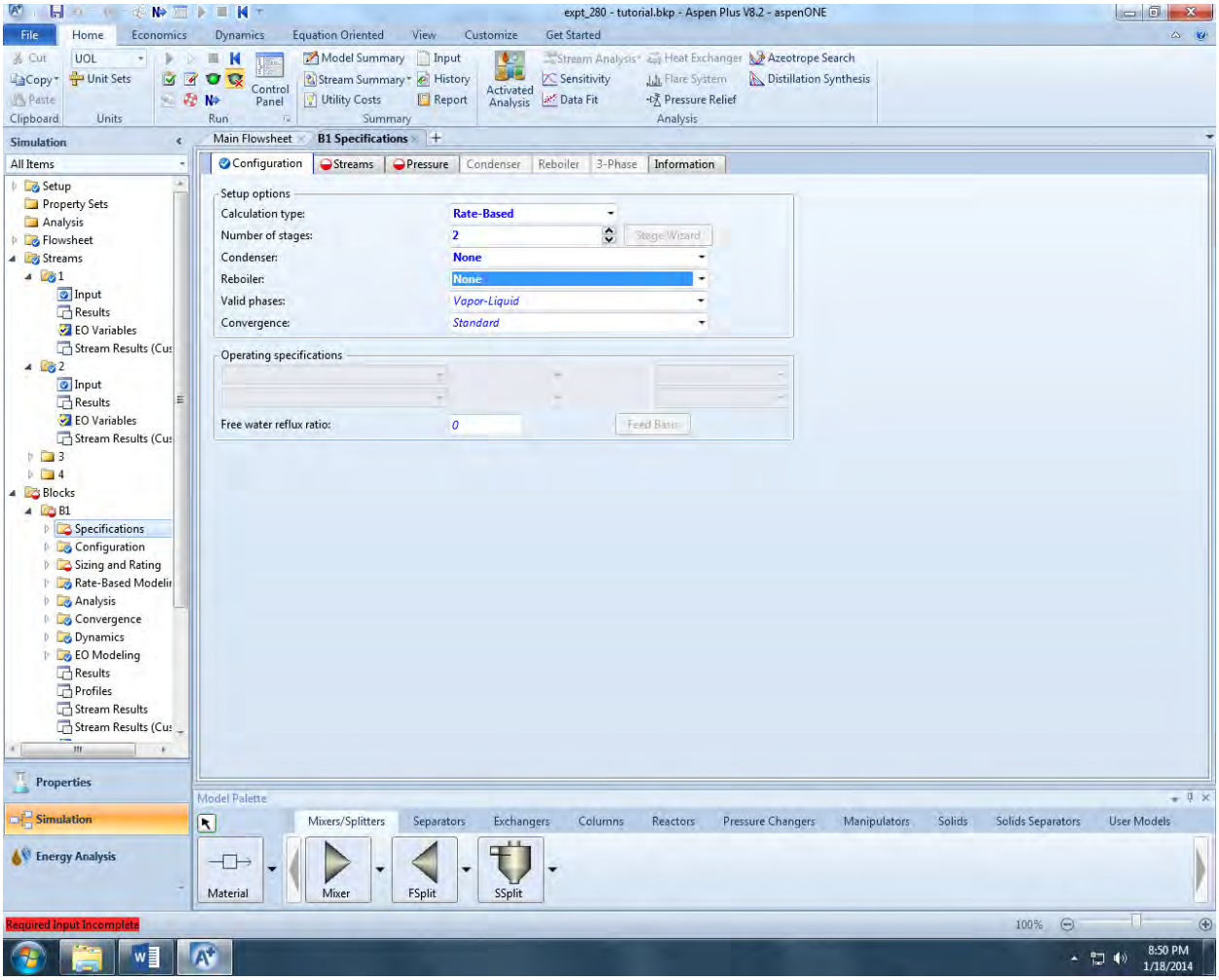
We observe that the Total value of the mole fractions equals exactly 1, which suggests that the data entry may have been correct.

Next step:
Enter the values for stream 2 (the water inlet).

The tab label indicates 2 to remind the user that these are the specifications for stream 2.



Next step:
Click on **Simulation** ≫ **Blocks** ≫ **B1** ≫ **Specifications** ≫ **Setup**
Enter values for the absorber block on the **Configuration** tab.
For Calculation type, enter **Rate-based** (not Equilibrium).

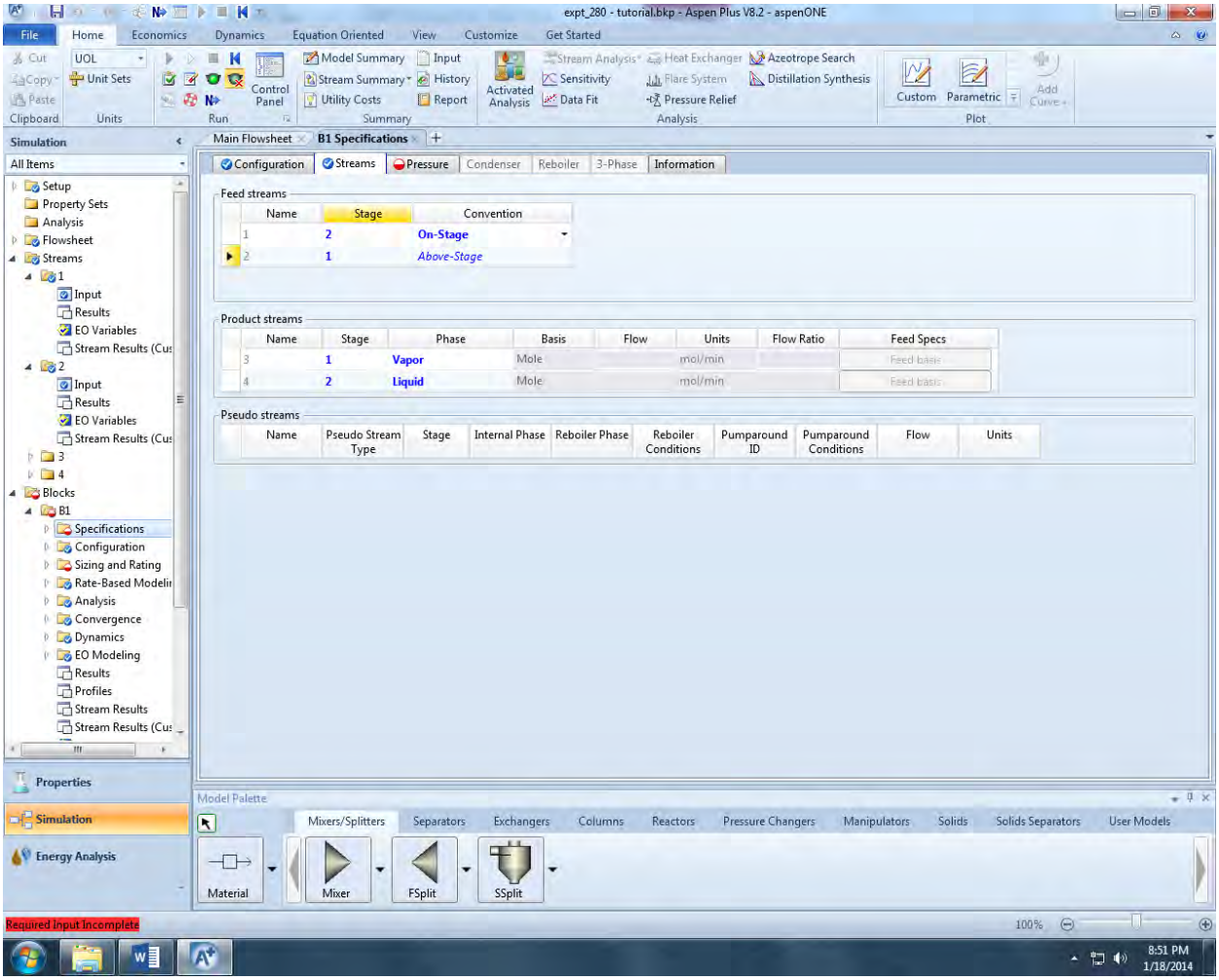


Next step:

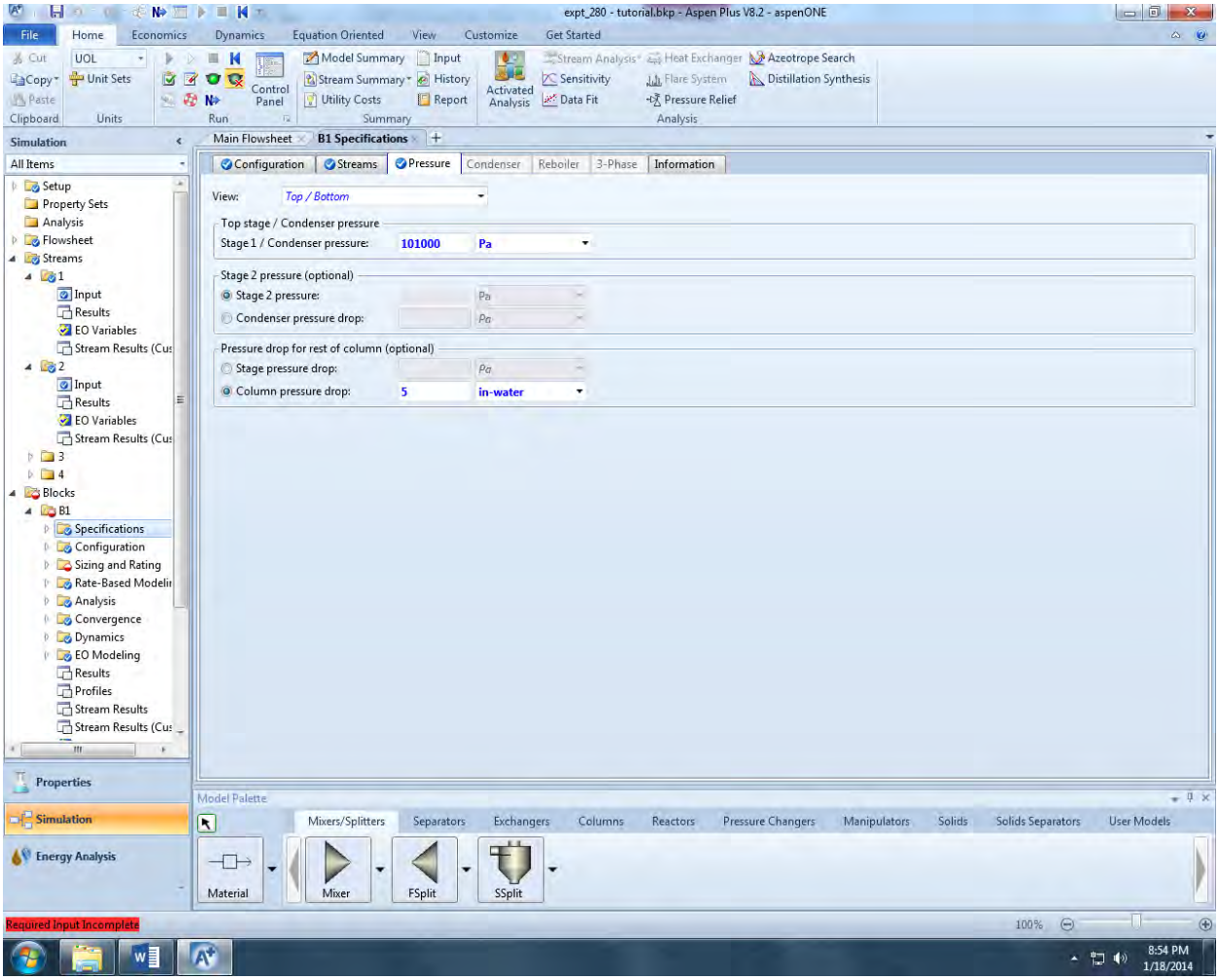
Enter column entry points of the feeds on the **Streams** tab.

The top stage in Aspen Plus® is always number 1.

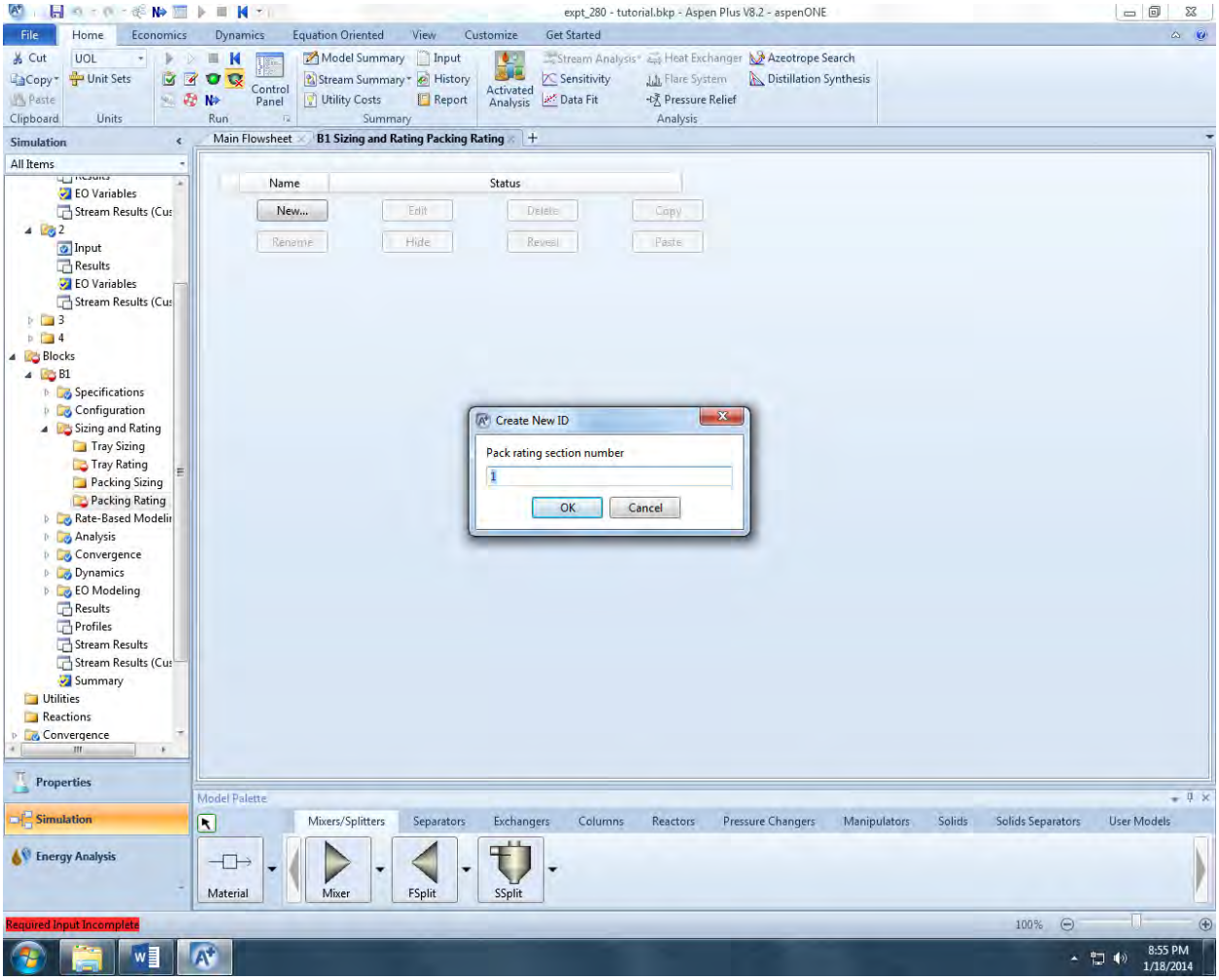
So in this case, the inlet water stage enters above stage 1.



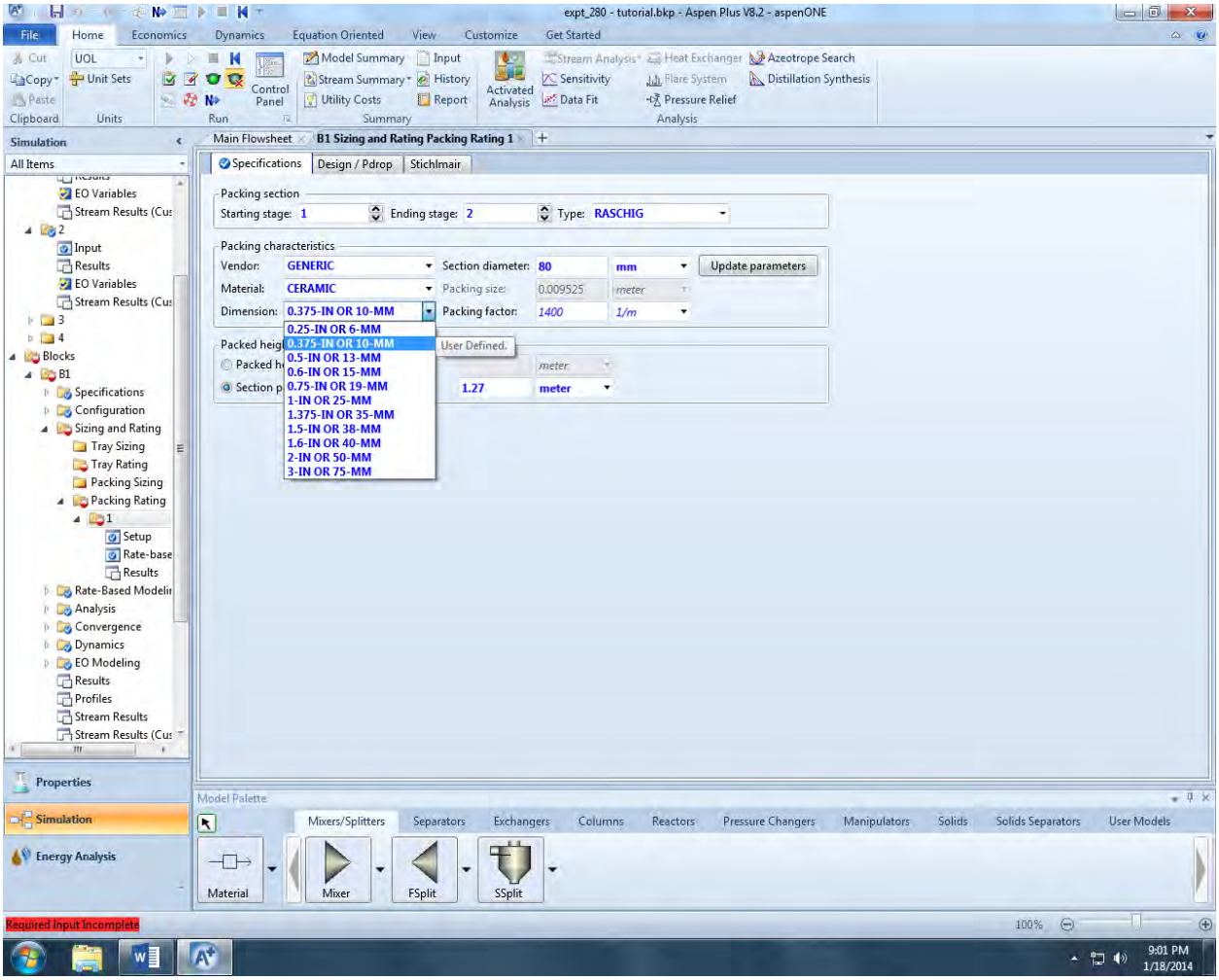
Next step:
Enter the operating pressures from the problem statement on the **Pressure** tab.



Next step:
Click on **Simulation** ≫ **Blocks** ≫ **B1** ≫ **Sizing and Rating** ≫ **Packing Rating.**
Click on the **New** button.

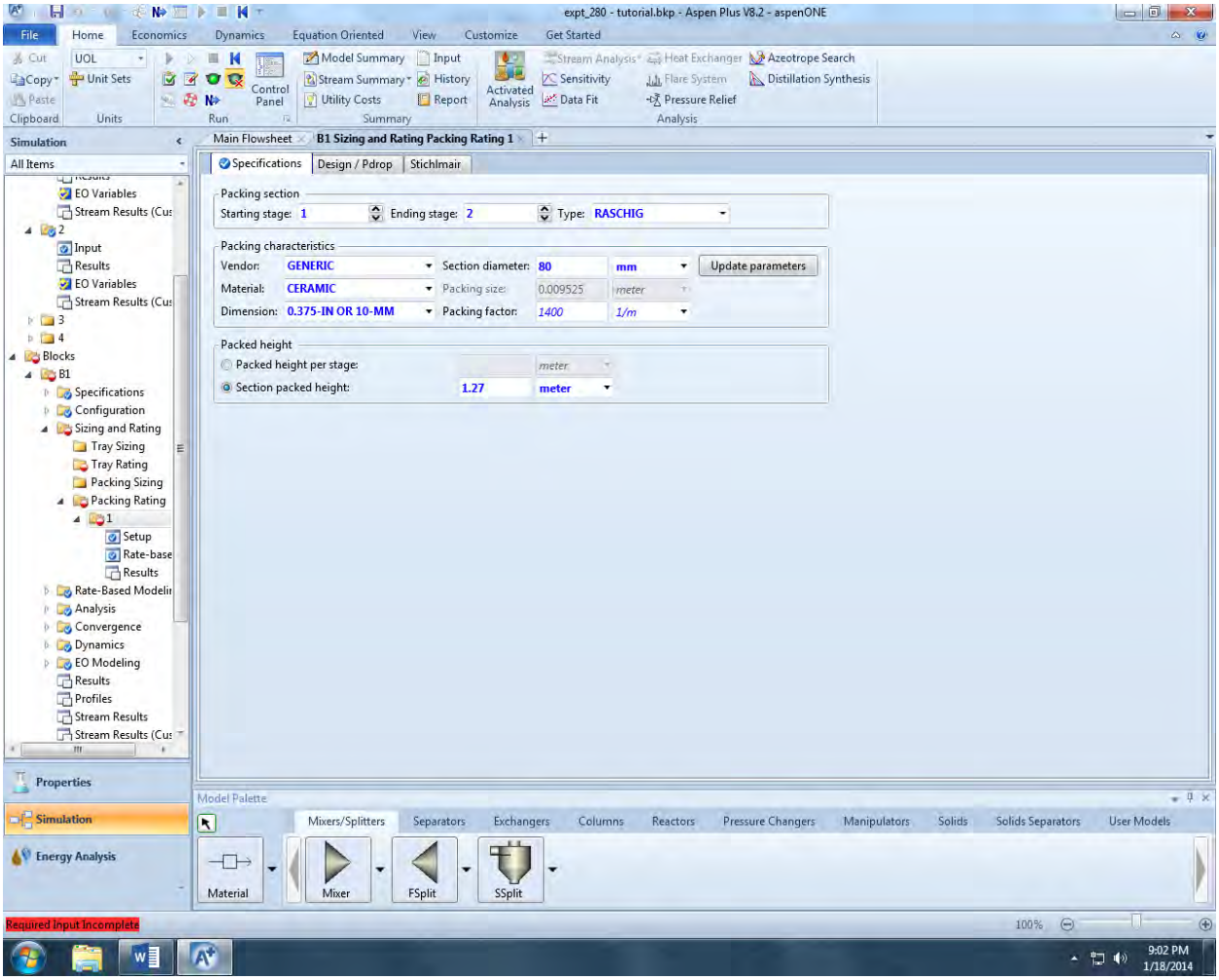


Next step:
Click **OK**.
Enter the data from the equipment data sheets.



Note:
Pay particular attention to the radio buttons for Packed Height. There can be a huge difference in the options.

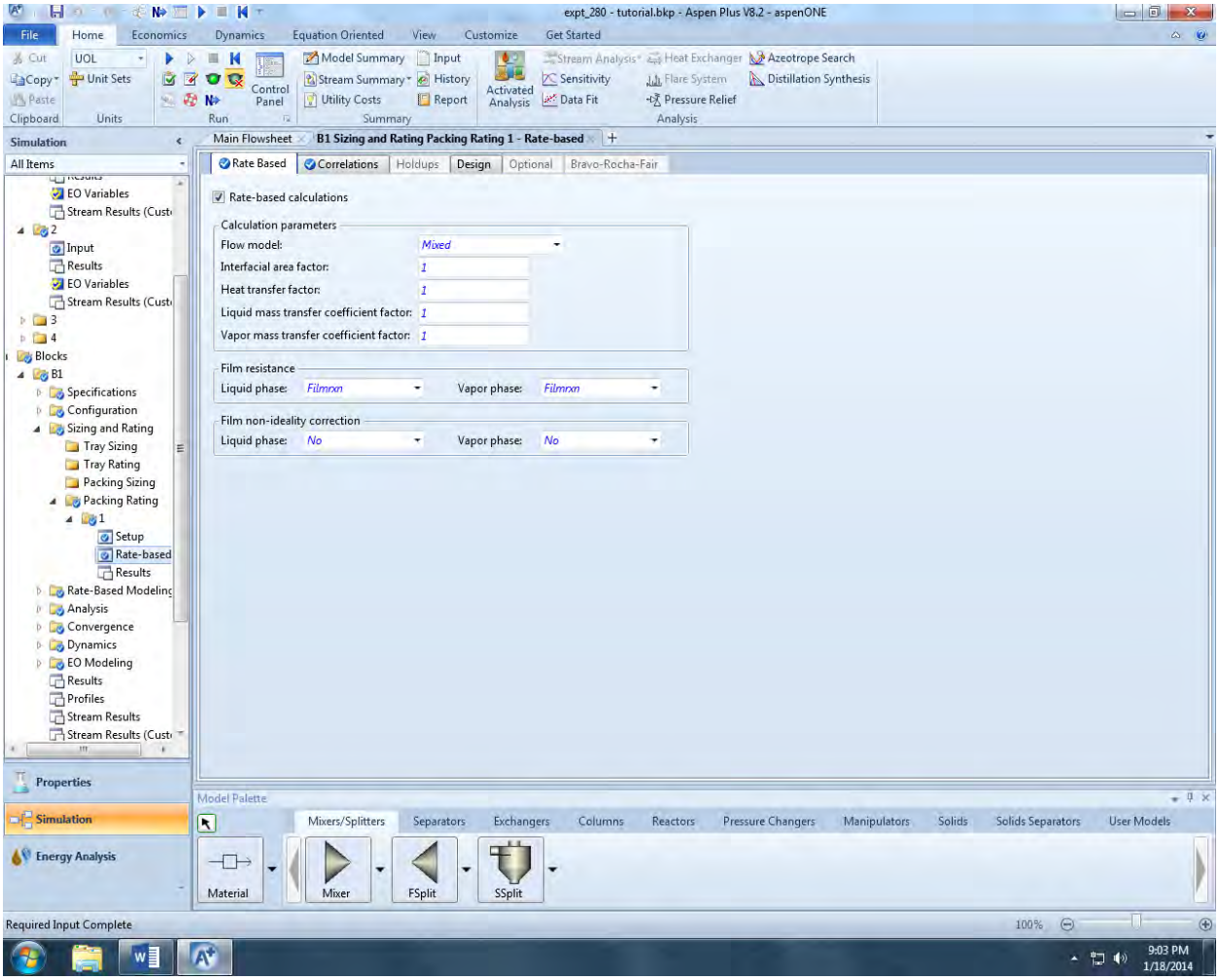
In this case, the packed height per stage is 1.27 m / 2 = 0.635 m.



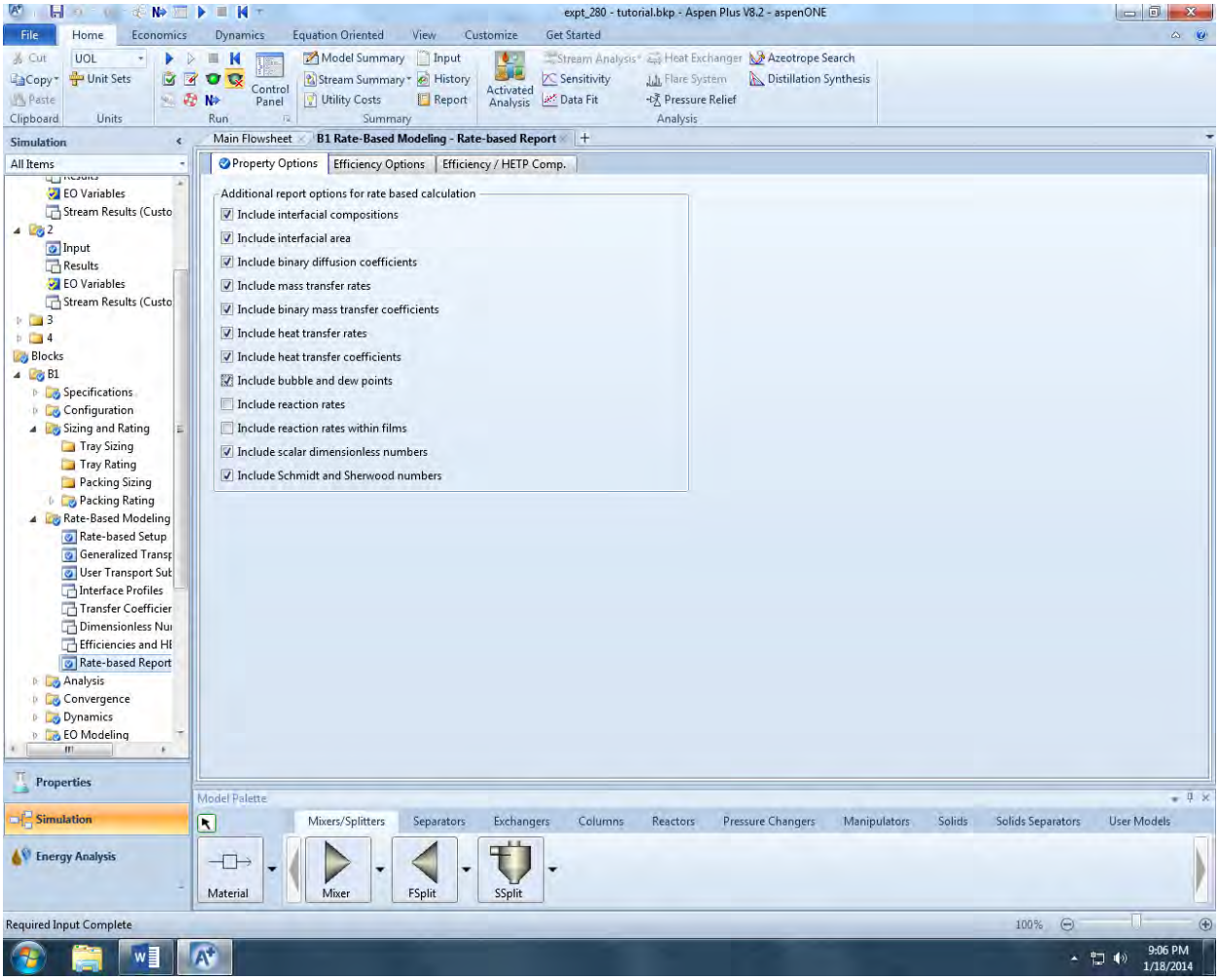
Next step:

Click on **Simulation** ≫ **Blocks** ≫ **B1** ≫ **Sizing and Rating** ≫ **Packing Rating** ≫ **Rate-based.**

Then mark the checkbox for Rate-based calculations.



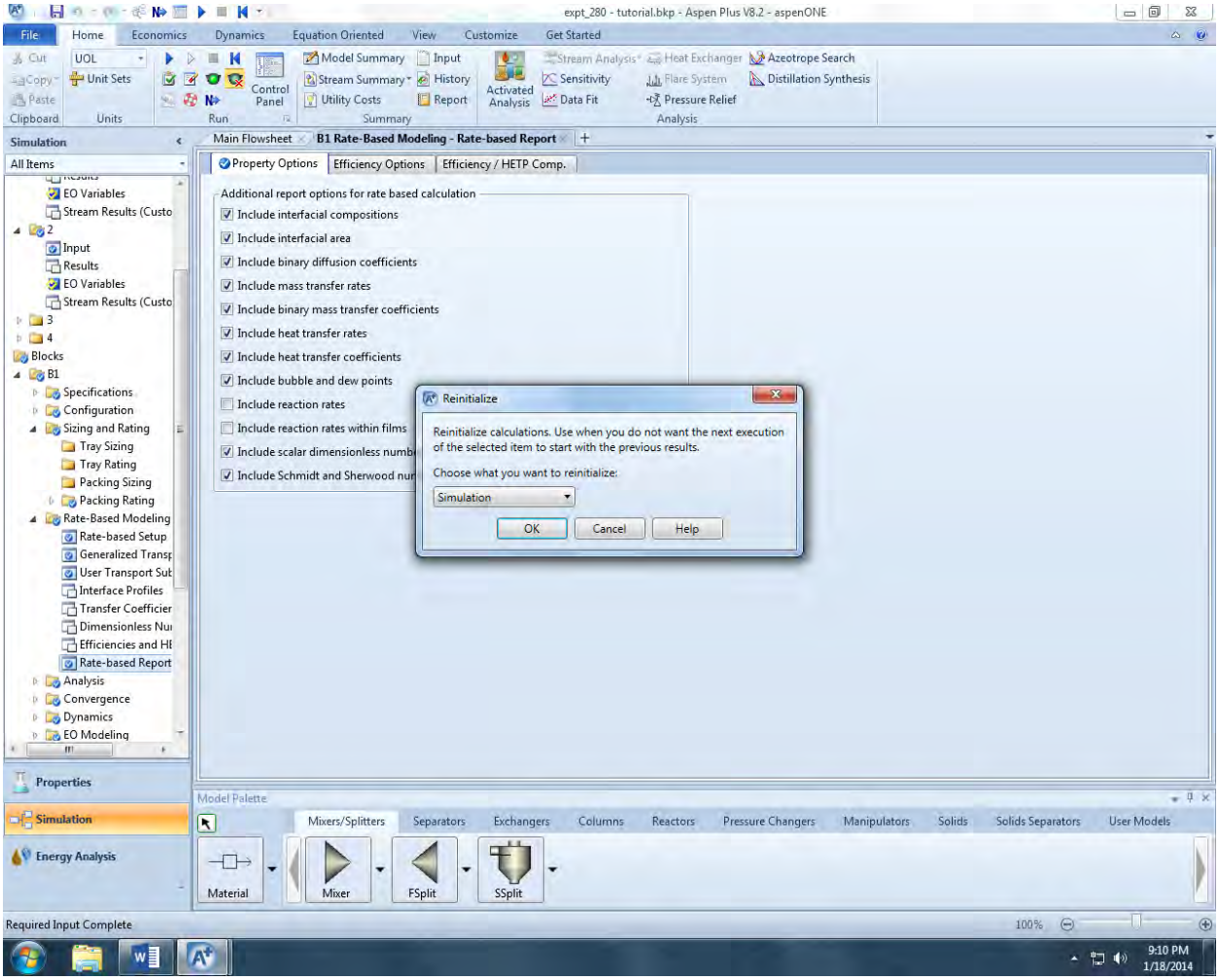
Next step:
Click on:
Simulation ≫ **Blocks** ≫ **B1** ≫ **Rate-based Modeling** ≫ **Rate-based Report.**
On the tab for Property Options:
Mark all the checkboxes, except for those pertaining to reaction.
(There is no chemical reaction in this problem.)



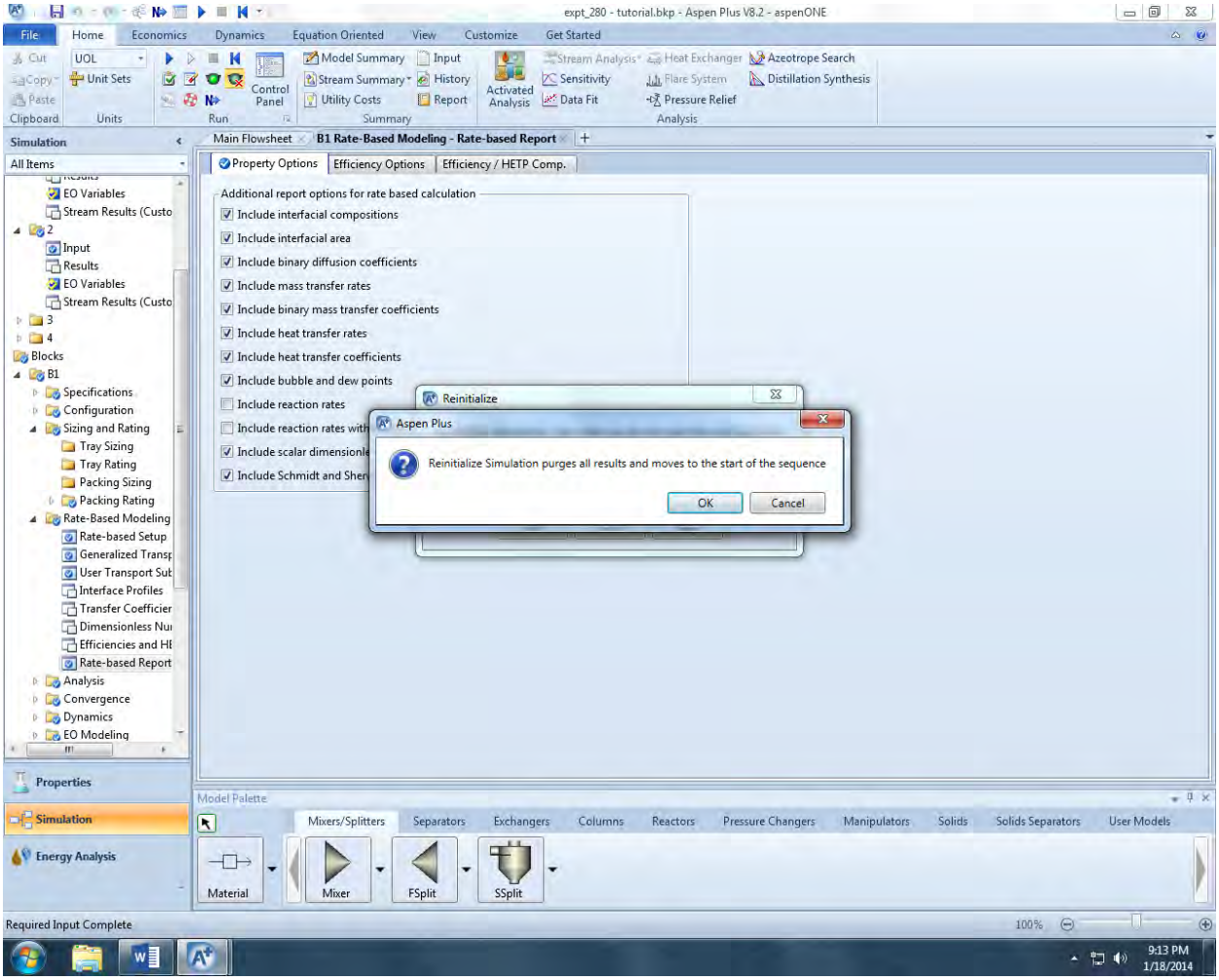
Press **Ctrl + S**.

☺ We have now completed specifying the equipment characteristics and operating conditions.

Next step:
Click the **Reinitialize** icon on the Ribbon. This icon has the shape of a diode symbol (left pointing triangle with a vertical line segment at the tip). Alternatively, enter from the keyboard **Shift + F5**.



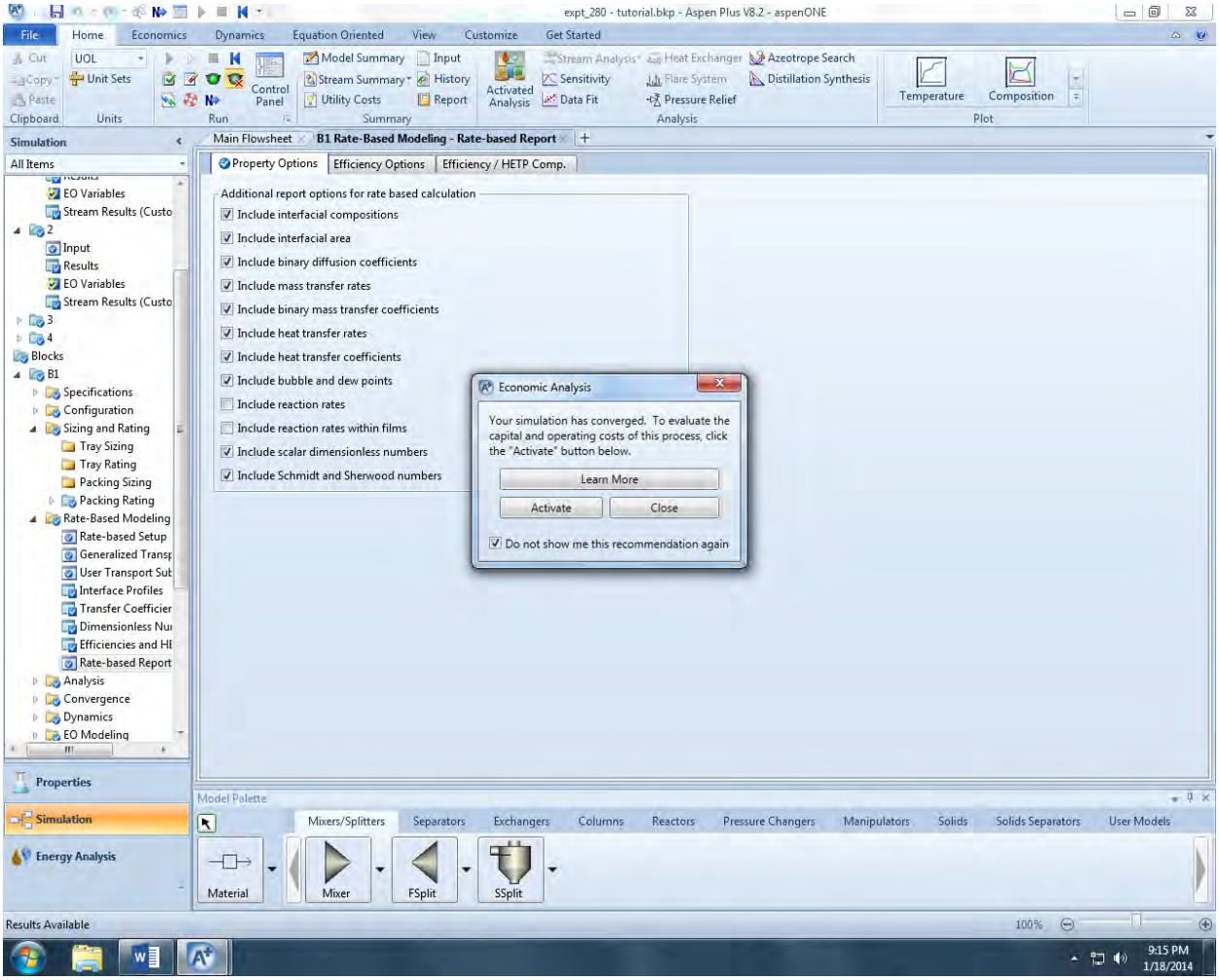
Click the **OK** button on the Reinitialize window.



Click the **OK** button on the Aspen Plus® query window.

Click the **Run** icon on the Ribbon. This icon has the shape of a triangle (right pointing). Alternatively, enter from the keyboard **F5**.

Allow the calculations to complete (typically less than a minute).



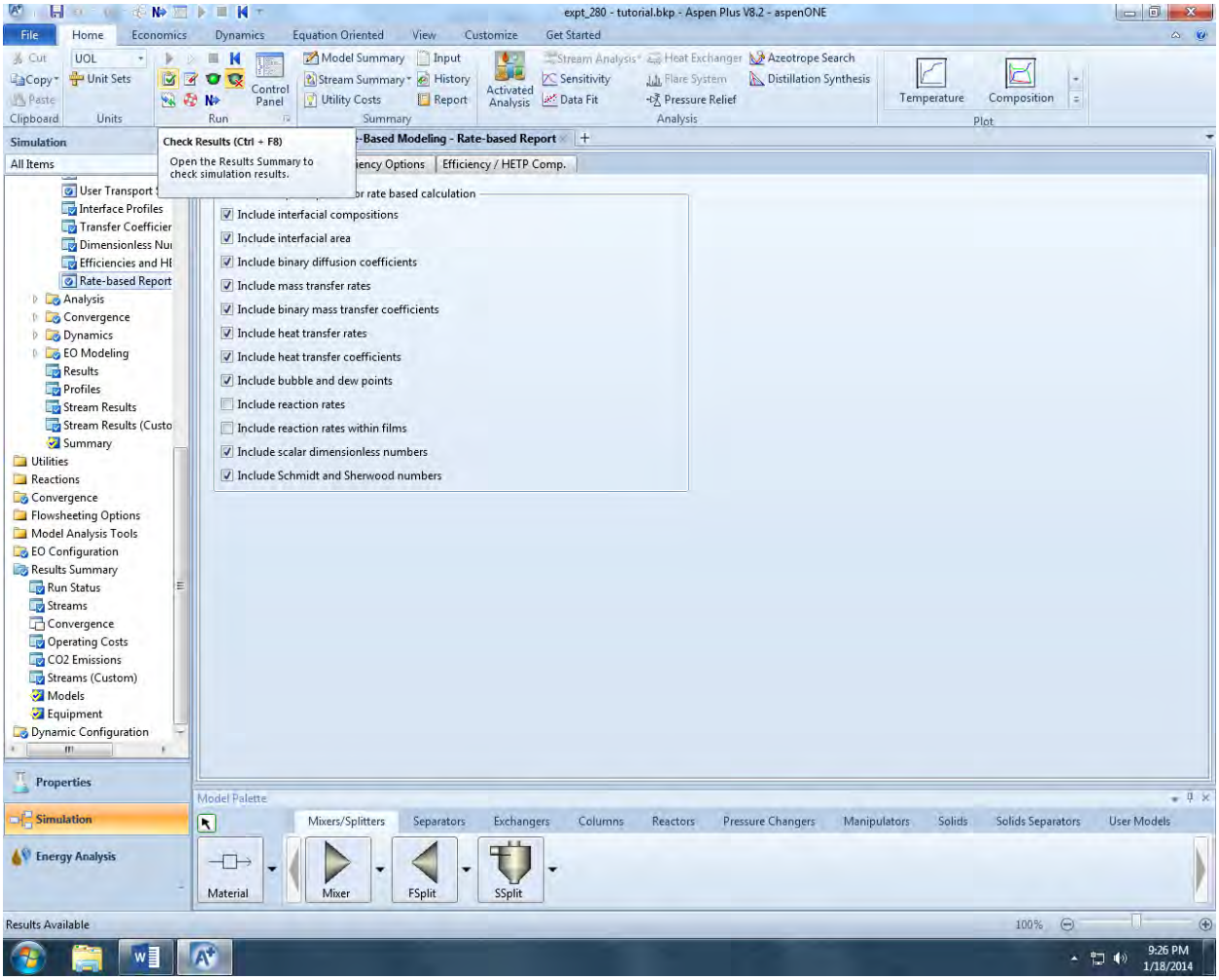
You'll do plenty of economic analysis in your process design course, but not this semester in the laboratory course.

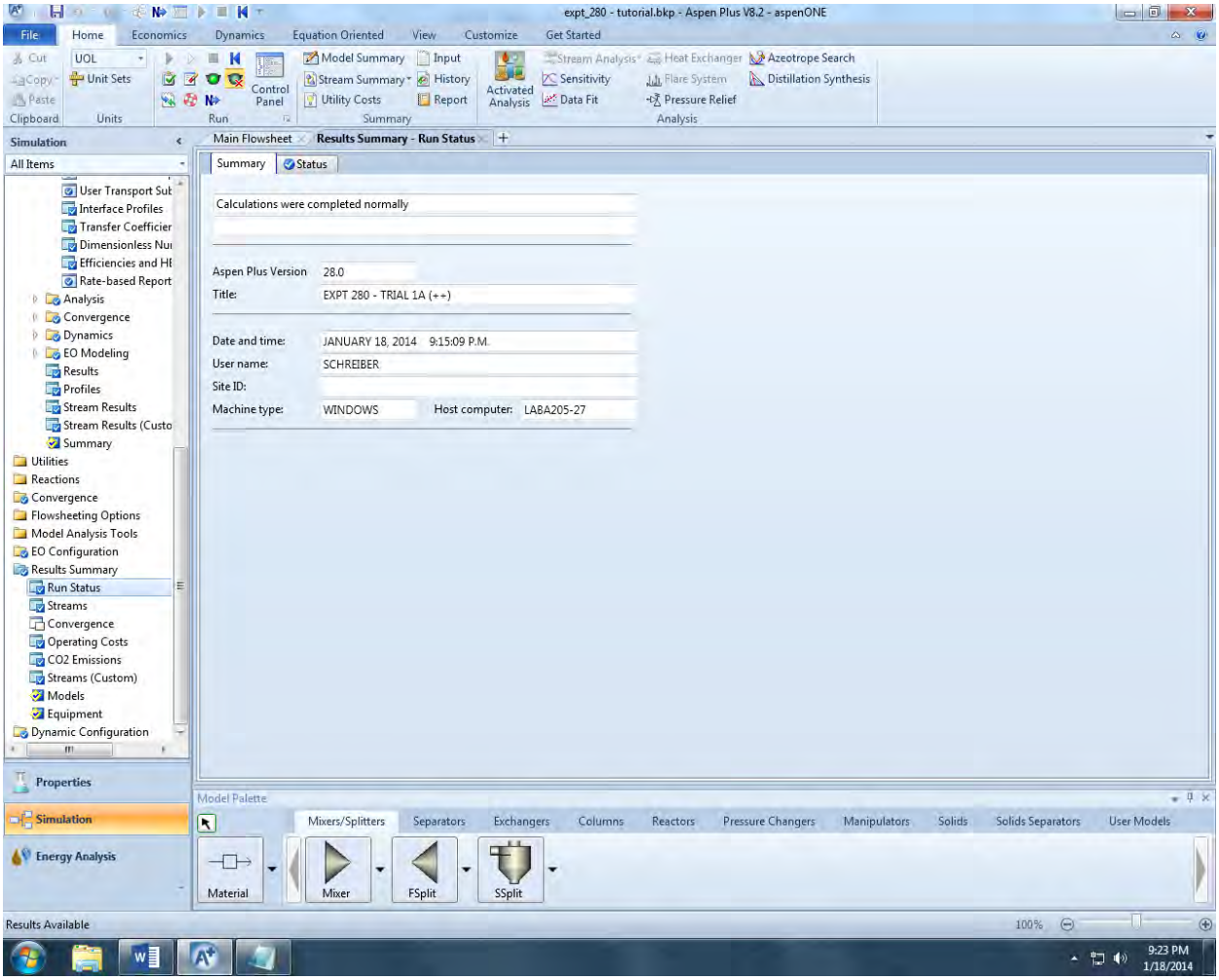
Mark the checkbox **Do not show me this recommendation again**.

Click the **Close** button on the Economic Analysis.

Press **Ctrl + S**.

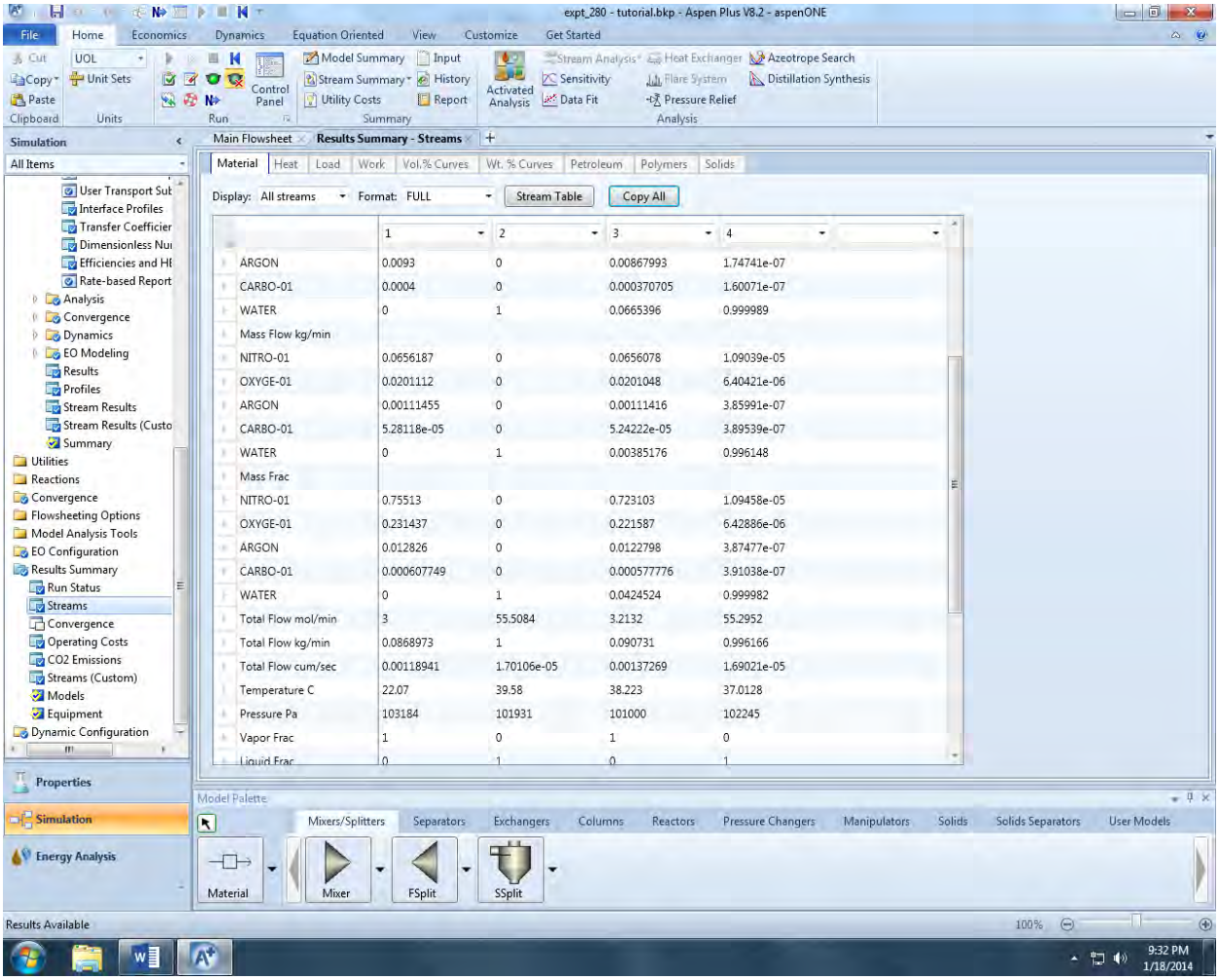
Click on the **Check Results** icon on the Ribbon (or alternatively press **Ctrl + F8**).


expt_280 - tutorial.bkp - Aspen Plus V8.2 - aspenONE
File
Home
Economics
Dynamics
Equation Oriented
View
Customize
Get Started
Check Results (Ctrl + F8)
Open the Results Summary to check simulation results.
Include interfacial compositions
Include interfacial area
Include binary diffusion coefficients
Include mass transfer rates
Include binary mass transfer coefficients
Include heat transfer rates
Include heat transfer coefficients
Include bubble and dew points
Include reaction rates
Include reaction rates within films
Include scalar dimensionless numbers
Include Schmidt and Sherwood numbers
Model Palette
Mixers/Splitters
Separators
Exchangers
Columns
Reactors
Pressure Changers
Manipulators
Solids
Solids Separators
User Models
Material
Mixer
FSplit
SSplit
Results Available
9:26 PM
1/18/2014



We observe that this was a clean run.
“Calculations were completed normally”

Click on **Stream Summary** on the Ribbon.



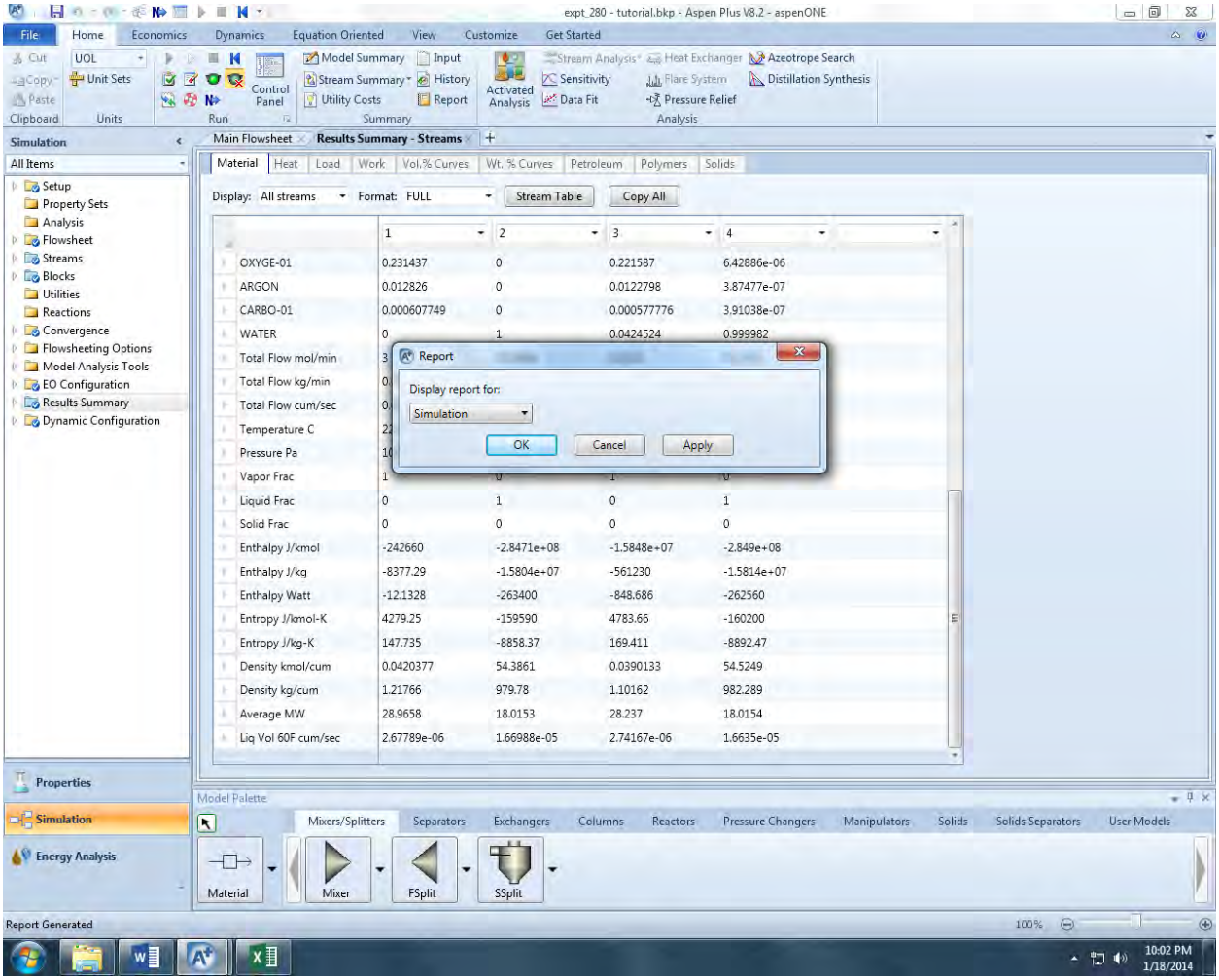
Click on the COPY ALL button, paste the data into an Excel worksheet, and pretty it up as you wish.

Excel worksheet of stream table from Aspen Plus®

	1	2	3	4
	B1	B1	B1	B1
	VAPOR	LIQUID	VAPOR	LIQUID
Mole Flow mol/min				
NITRO-01	2.34240	0.00000	2.34201	0.00039
OXYGE-01	0.62850	0.00000	0.62830	0.00020
ARGON	0.02790	0.00000	0.02789	0.00001
CARBO-01	0.00120	0.00000	0.00119	0.00001
WATER	0.00000	55.50844	0.21381	55.29463
Mole Frac				
NITRO-01	0.78080	0.00000	0.72887	0.0000070
OXYGE-01	0.20950	0.00000	0.19554	0.0000036
ARGON	0.00930	0.00000	0.00868	0.0000002
CARBO-01	0.00040	0.00000	0.00037	0.0000002
WATER	0.00000	1.00000	0.06654	0.9999890
Mass Flow kg/min				
NITRO-01	0.06562	0.00000	0.06561	0.00001
OXYGE-01	0.02011	0.00000	0.02010	0.00001
ARGON	0.00111	0.00000	0.00111	0.00000
CARBO-01	0.00005	0.00000	0.00005	0.00000
WATER	0.00000	1.00000	0.00385	0.99615
Mass Frac				
NITRO-01	0.75513	0.00000	0.72310	0.0000109
OXYGE-01	0.23144	0.00000	0.22159	0.0000064
ARGON	0.01283	0.00000	0.01228	0.0000004
CARBO-01	0.00061	0.00000	0.00058	0.0000004
WATER	0.00000	1.00000	0.04245	0.9999818
Total Flow mol/min	3.00000	55.50844	3.21320	55.29524
Total Flow kg/min	0.08690	1.00000	0.09073	0.99617
Total Flow cum/sec	0.00119	0.00002	0.00137	0.00002
Temperature C	22.07000	39.58000	38.22304	37.01275
Pressure Pa	103184	101931	101000	102245
Vapor Frac	1.00000	0.00000	1.00000	0.00000
Liquid Frac	0.00000	1.00000	0.00000	1.00000
Solid Frac	0.00000	0.00000	0.00000	0.00000
		-	-	-
Enthalpy J/kmol	-242660	284710000	15848000	284900000
Enthalpy J/kg	-8377	-15804000	-561230	-15814000
Enthalpy Watt	-12.13	-263400	-848.69	-262560
Entropy J/kmol-K	4279.25	-159590	4783.66	-160200
Entropy J/kg-K	147.73	-8858	169.41	-8892
Density kmol/cum	0.04204	54.38605	0.03901	54.52492
Density kg/cum	1.21766	979.77990	1.10162	982.28870
Average MW	28.96579	18.01528	28.23700	18.01541
Liq Vol 60F cum/sec	0.00000	0.00002	0.00000	0.00002

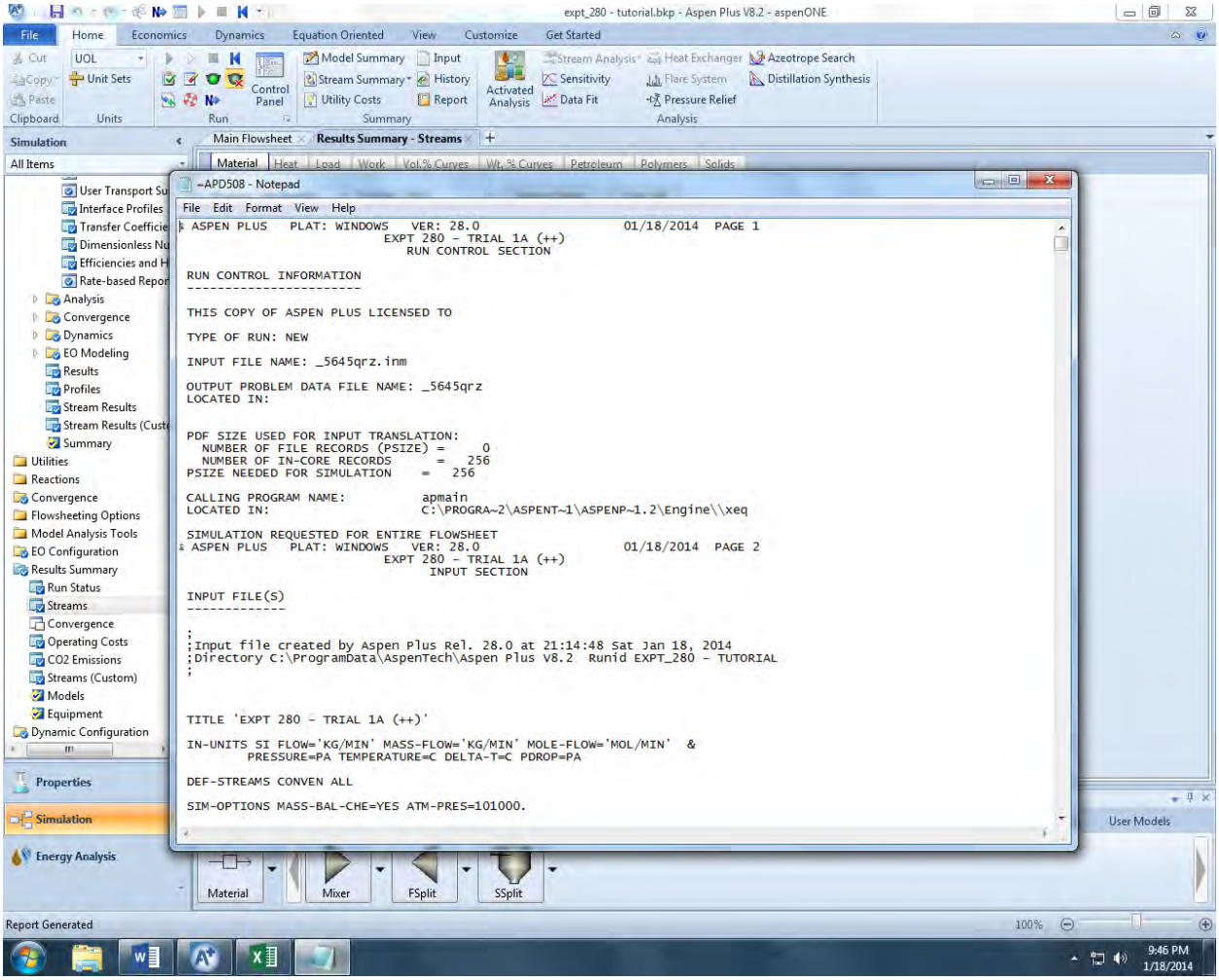
Next step:

Click on **Report** in the Ribbon (or, **Ctrl + Alt + R**) and then select **Simulation**.



Note

Next step:
Click **OK**



Next step:
Save the simulation report file.

Format this text file, as needed, to furnish a neat display.
This typically requires margins of 0.5" on all four sides.

THE END

EXPT 280 - TRIAL 1A (++)
RUN CONTROL SECTION

RUN CONTROL INFORMATION

THIS COPY OF ASPEN PLUS LICENSED TO

TYPE OF RUN: NEW

INPUT FILE NAME: _5645qrz.inm

OUTPUT PROBLEM DATA FILE NAME: _5645qrz
LOCATED IN:

PDF SIZE USED FOR INPUT TRANSLATION:
  NUMBER OF FILE RECORDS (PSIZE) =   0
  NUMBER OF IN-CORE RECORDS   =   256
PSIZE NEEDED FOR SIMULATION   =   256

CALLING PROGRAM NAME: apmain
LOCATED IN: C:\PROGRA~2\ASPENT~1\ASPENP~1.2\Engine\\xeq

SIMULATION REQUESTED FOR ENTIRE FLOWSHEET

INPUT FILE(S)

```
;
;Input file created by Aspen Plus Rel. 28.0 at 21:14:48 Sat Jan 18, 2014
;Directory C:\ProgramData\AspenTech\Aspen Plus V8.2  Runid EXPT_280 - TUTORIAL
;



TITLE 'EXPT 280 - TRIAL 1A (++)'

IN-UNITS SI FLOW='KG/MIN' MASS-FLOW='KG/MIN' MOLE-FLOW='MOL/MIN'  &
        PRESSURE=PA TEMPERATURE=C DELTA-T=C PDROP=PA

DEF-STREAMS CONVEN ALL

SIM-OPTIONS MASS-BAL-CHE=YES ATM-PRES=101000.

MODEL-OPTION

DATABANKS 'APV82 PURE28' / 'APV82 AQUEOUS' / 'APV82 SOLIDS' /  &
        'APV82 INORGANIC' / NOASPENPCD

PROP-SOURCES 'APV82 PURE28' / 'APV82 AQUEOUS' / 'APV82 SOLIDS' &
         / 'APV82 INORGANIC'

COMPONENTS
    NITRO-01 N2 /
    OXYGE-01 O2 /
    ARGON AR /
    CARBO-01 CO2 /
    WATER H2O

HENRY-COMPS HC-1 NITRO-01 OXYGE-01 ARGON CARBO-01

SOLVE
    RUN-MODE MODE=SIM

FLOWSHEET
    BLOCK B1 IN=1 2 OUT=3 4

PROPERTIES IDEAL HENRY-COMPS=HC-1
    PROPERTIES AMINES / LK-PLOCK / PC-SAFT

PROP-DATA LKPKIJ-1
    IN-UNITS SI FLOW='KG/MIN' MASS-FLOW='KG/MIN'  &
        MOLE-FLOW='MOL/MIN' PRESSURE=PA TEMPERATURE=C DELTA-T=C  &
        PDROP=PA
    PROP-LIST LKPKIJ
    BPVAL NITRO-01 OXYGE-01 -8.9000000E-3
```

INPUT FILE(S) (CONTINUED)

```
    BPVAL NITRO-01 ARGON -.0152000000
    BPVAL NITRO-01 CARBO-01 .1074000000
    BPVAL OXYGE-01 ARGON -.0144000000
    BPVAL OXYGE-01 NITRO-01 -8.9000000E-3
    BPVAL ARGON OXYGE-01 -.0144000000
    BPVAL ARGON NITRO-01 -.0152000000
    BPVAL CARBO-01 NITRO-01 .1074000000
    BPVAL CARBO-01 WATER -.0633000000
    BPVAL WATER CARBO-01 -.0633000000

PROP-DATA HENRY-1
    IN-UNITS SI FLOW='KG/MIN' MASS-FLOW='KG/MIN'  &
        MOLE-FLOW='MOL/MIN' PRESSURE=PA TEMPERATURE=C DELTA-T=C  &
        PDROP=PA
    PROP-LIST HENRY
    BPVAL NITRO-01 WATER 176.5070000 -8432.770000 -21.55800000  &
        -8.4362400E-3 -.1500000000 72.85000000 0.0
    BPVAL OXYGE-01 WATER 155.9210000 -7775.060000 -18.39740000  &
        -9.4435400E-3 .8500000000 74.85000000 0.0
    BPVAL ARGON WATER 180.9910000 -8137.130000 -23.25470000  &
        3.06357000E-3 .8500000000 73.85000000 0.0
    BPVAL CARBO-01 WATER 171.3780000 -8741.550000 -21.66900000  &
        1.10259000E-3 -.1500000000 79.85000000 0.0

STREAM-NAMES
    NAMES 1 "Gas inlet"
    NAMES 2 "Liquid inlet"
    NAMES 3 "Gas outlet"
    NAMES 4 "Liquid outlet"

STREAM 1
    SUBSTREAM MIXED TEMP=22.07 PRES=103184. MOLE-FLOW=3.
    MOLE-FRAC NITRO-01 0.7808 / OXYGE-01 0.2095 / ARGON  &
        0.0093 / CARBO-01 0.0004

STREAM 2
    SUBSTREAM MIXED TEMP=39.58 PRES=101931. MASS-FLOW=1.
    MASS-FRAC WATER 1.

BLOCK B1 RADFRAC
    PARAM NSTAGE=2 ALGORITHM=STANDARD MAXOL=25 DAMPING=NONE
    COL-CONFIG CONDENSER=NONE REBOILER=NONE
    RATESEP-ENAB CALC-MODE=RIG-RATE
    FEEDS 1 2 ON-STAGE / 2 1
    PRODUCTS 3 1 V / 4 2 L
    P-SPEC 1 101000.
    COL-SPECS DP-COL=5. <IN-WATER>
    TRAY-REPORT BUBBLE-DEW=YES
```

INPUT FILE(S) (CONTINUED)

```
    PACK-RATE 1 1 2 RASCHIG VENDOR=GENERIC PACK-MAT=CERAMIC  &
        PACK-SIZE="0.375-IN" PACK-HT=1.27 DIAM=80. <MM>  &
        P-UPDATE=NO
    PACK-RATE2 1 RATE-BASED=YES MTRFC-CORR=ONDA-68  &
        INTFA-CORR=ONDA-68
    REPORT INT-PROFILE INT-AREA DIFF-COEFF MT-RATE MT-COEFF  &
        HT-RATE HT-COEFF S-DIMLESS V-DIMLESS

EO-CONV-OPTI

REPORT INPUT LINES=55

STREAM-REPOR MOLEFLOW MASSFLOW MOLEFRAC MASSFRAC

PROPERTY-REP PARAMS PCES PARAM-PLUS
;
;
;
;
;
```

EXPT 280 - TRIAL 1A (++)

FLOWSHEET SECTION

FLOWSHEET CONNECTIVITY BY STREAMS

STREAM	SOURCE	DEST	STREAM	SOURCE	DEST
2	----	B1	1	----	B1
3	B1	----	4	B1	----

FLOWSHEET CONNECTIVITY BY BLOCKS

BLOCK	INLETS	OUTLETS
B1	1 2	3 4

COMPUTATIONAL SEQUENCE

SEQUENCE USED WAS:
B1

OVERALL FLOWSHEET BALANCE

*** MASS AND ENERGY BALANCE ***

	IN	OUT	RELATIVE DIFF.
CONVENTIONAL COMPONENTS (MOL/MIN)			
NITRO-01	2.34240	2.34240	0.541030E-09
OXYGE-01	0.628500	0.628500	0.540936E-09
ARGON	0.279000E-01	0.279000E-01	0.540903E-09
CARBO-01	0.120000E-02	0.120000E-02	0.526876E-09
WATER	55.5084	55.5084	-0.292389E-10
TOTAL BALANCE			
MOLE(MOL/MIN)	58.5084	58.5084	0.00000
MASS(KG/MIN)	1.08690	1.08690	0.163511E-10
ENTHALPY(WATT)	-263410.	-263410.	-0.114225E-09

*** CO2 EQUIVALENT SUMMARY ***

FEED STREAMS CO2E	0.528118E-04	KG/MIN
PRODUCT STREAMS CO2E	0.528118E-04	KG/MIN
NET STREAMS CO2E PRODUCTION	-0.278253E-13	KG/MIN
UTILITIES CO2E PRODUCTION	0.00000	KG/MIN
TOTAL CO2E PRODUCTION	-0.278253E-13	KG/MIN

EXPT 280 - TRIAL 1A (++)
PHYSICAL PROPERTIES SECTION

COMPONENTS

ID	TYPE	ALIAS	NAME
NITRO-01	C	N2	NITROGEN
OXYGE-01	C	O2	OXYGEN
ARGON	C	AR	ARGON
CARBO-01	C	CO2	CARBON-DIOXIDE
WATER	C	H2O	WATER

LISTID	SUPERCRITICAL COMPONENT LIST
HC-1	NITRO-01 OXYGE-01 ARGON CARBO-01

PARAMETER VALUES

CONVENTIONAL COMPONENT - UNARY PARAMETER TABLE

PARAMETER NAME/SET/EL		COMPONENTS NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
ZC	1	2.89000-01	2.88000-01	2.91000-01	2.74000-01	2.29000-01
TC	1	1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47096+02
PC	1	3.40000+06	5.04300+06	4.89800+06	7.38300+06	2.20640+07
MW	1	2.80135+01	3.19988+01	3.99480+01	4.40098+01	1.80153+01
PLXANT	1	1 5.82820+01	5.12450+01	4.21270+01	1.40540+02	7.36490+01
		2 -1.08410+03	-1.20020+03	-1.09310+03	-4.73500+03	-7.25820+03
		3 0.0	0.0	0.0	0.0	0.0
		4 0.0	0.0	0.0	0.0	0.0
		5 -8.31440 00	-6.43610 00	-4.14250 00	-2.12680+01	-7.30370 00
		6 4.41270-02	2.84050-02	5.72540-05	4.09090-02	4.16530-06
		7 1.00000 00	1.00000 00	2.00000 00	1.00000 00	2.00000 00
		8 6.31500+01	5.43600+01	8.37800+01	2.16580+02	2.73160+02
		9 1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47100+02
TB	1	7.73440+01	9.01880+01	8.72800+01	1.94700+02	3.73150+02
CPIG	1	1 MISSING	MISSING	2.08042+04	1.97952+04	MISSING
		2 0.0	0.0	-3.21128-02	7.34365+01	0.0
		3 0.0	0.0	5.16651-05	-5.60194-02	0.0
		4 0.0	0.0	0.0	1.71533-05	0.0
		5 0.0	0.0	0.0	0.0	0.0
		6 0.0	0.0	0.0	0.0	0.0
		7 0.0	0.0	3.50000+02	3.00000+02	0.0
		8 1.00000+03	1.00000+03	1.00000+03	1.08860+03	1.00000+03
		9 MISSING	MISSING	2.07850+04	2.90990+04	MISSING
		10 MISSING	MISSING	2.15170-03	7.18760-01	MISSING
		11 MISSING	MISSING	1.50000 00	1.63680 00	MISSING
DHVLWT	1	1 MISSING	MISSING	MISSING	MISSING	MISSING
		2 MISSING	MISSING	MISSING	MISSING	MISSING
		3 3.80000-01	3.80000-01	3.80000-01	3.80000-01	3.80000-01
		4 0.0	0.0	0.0	0.0	0.0
		5 0.0	0.0	0.0	0.0	0.0
OMEGA	1	3.77215-02	2.21798-02	0.0	2.23621-01	3.44861-01

PARAMETER VALUES (CONTINUED)

DHFORM	1		0.0	0.0	0.0	-3.93510+08	-2.41818+08
DGFORM	1		0.0	0.0	0.0	-3.94370+08	-2.28572+08
VLSTD	1		5.35578-02	5.35578-02	5.35578-02	5.35578-02	1.80500-02
SG	1		3.00000-01	3.00000-01	3.00000-01	3.00000-01	1.00000 00
API	1		3.40000+02	3.40000+02	3.40000+02	3.40000+02	1.00000+01
WATSOL	1	1	-5.30000 00	-5.30000 00	-5.30000 00	-5.30000 00	1.76832 00
		2	-5.00000+02	-5.00000+02	-5.00000+02	-5.00000+02	-2.28298+03
		3	0.0	0.0	0.0	0.0	0.0
		4	2.00000+02	2.00000+02	2.00000+02	2.00000+02	0.0
		5	3.73000+02	3.73000+02	3.73000+02	3.73000+02	9.24913+02
CHARGE	1		0.0	0.0	0.0	0.0	0.0
HIGPY	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
		9	0.0	0.0	0.0	0.0	0.0
		10	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
PSEUDO	1		MISSING	MISSING	MISSING	MISSING	MISSING
CPIGDP	1	1	2.91050+04	2.91030+04	2.07860+04	2.93700+04	3.33630+04
		2	8.61490+03	1.00400+04	0.0	3.45400+04	2.67900+04
		3	1.70160+03	2.52650+03	0.0	1.42800+03	2.61050+03
		4	1.03470+02	9.35600+03	0.0	2.64000+04	8.89600+03
		5	9.09790+02	1.15380+03	0.0	5.88000+02	1.16900+03
		6	5.00000+01	5.00000+01	1.00000+02	5.00000+01	1.00000+02
		7	1.50000+03	1.50000+03	1.50000+03	5.00000+03	2.27315+03
ATOMNO	1	1	7.00000 00	8.00000 00	1.80000+01	6.00000 00	1.00000 00
		2	0.0	0.0	0.0	8.00000 00	8.00000 00
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
		9	0.0	0.0	0.0	0.0	0.0
		10	0.0	0.0	0.0	0.0	0.0
NOATOM	1	1	2.00000 00	2.00000 00	1.00000 00	1.00000 00	2.00000 00
		2	0.0	0.0	0.0	2.00000 00	1.00000 00
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
		9	0.0	0.0	0.0	0.0	0.0
		10	0.0	0.0	0.0	0.0	0.0
CPIXP1	1	1	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02

PARAMETER VALUES (CONTINUED)

		2	1.00000+03	1.00000+03	5.00000+03	1.00000+03	1.20000+03
		3	-6.55614+06	-3.46467+06	-6.19735+06	-4.05519+08	-2.52304+08
		4	1.68923+05	9.71783+04	1.39216+05	2.08205+05	2.68010+05
		5	-2.53171+04	-1.32017+04	-2.07860+04	-2.93419+04	-3.32484+04
		6	-1.10356 00	-2.27567+01	0.0	-2.24028+01	2.37049-01
		7	-1.70199-03	5.72448-03	0.0	4.04634-03	-2.17949-03
		8	4.53696-07	-8.14234-07	0.0	-4.10886-07	3.66987-07
		9	-2.42771+08	-4.19015+08	0.0	2.83617+08	1.17992+08
		10	1.35946+10	1.77957+10	0.0	-1.25450+10	-9.24171+09
CPIXP2	1	1	1.00000+03	1.00000+03	MISSING	1.00000+03	1.20000+03
		2	5.00000+03	3.00000+03	MISSING	3.00000+03	2.50000+03
		3	-2.20569+07	-1.82818+07	MISSING	-4.29051+08	-2.80324+08
		4	2.57745+05	2.68238+05	0.0	4.13593+05	3.67548+05
		5	-3.67817+04	-3.88584+04	0.0	-5.88099+04	-4.46634+04
		6	-2.86246-01	1.45889 00	0.0	-1.63155 00	-3.70790 00
		7	1.70355-05	-3.10073-04	0.0	1.51679-04	1.85761-04
		8	-7.51771-10	2.04865-08	0.0	-8.83643-09	-2.79906-09
		9	4.20149+09	1.68355+09	0.0	5.30058+09	1.16931+10
		10	-6.39852+11	-1.13530+11	0.0	-6.06527+11	-2.30214+12
CPIXP3	1	1	MISSING	3.00000+03	MISSING	MISSING	2.50000+03
		2	MISSING	5.00000+03	MISSING	MISSING	5.00000+03
		3	MISSING	-5.77657+07	MISSING	MISSING	-2.66964+08
		4	0.0	2.97323+05	0.0	0.0	3.34868+05
		5	0.0	-4.05502+04	0.0	0.0	-4.07975+04
		6	0.0	-1.99026 00	0.0	0.0	-4.39824 00
		7	0.0	1.85450-04	0.0	0.0	2.47266-04
		8	0.0	-8.49773-09	0.0	0.0	-7.91235-09
		9	0.0	4.83512+10	0.0	0.0	4.83595+08
		10	0.0	-2.42056+13	0.0	0.0	2.44832+12
TFP	1		MISSING	MISSING	MISSING	MISSING	MISSING
S025E	1		1.91609+05	2.05147+05	1.54845+05	2.10887+05	0.0
WAGNER	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DHVLDS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPIGDS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	3.00000+03	3.00000+03	3.00000+03	3.00000+03	3.00000+03
CPIGYM 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
	5	0.0	0.0	0.0	0.0	0.0
	6	2.00000+03	2.00000+03	2.00000+03	2.00000+03	2.00000+03
PDSNEL 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
HCTYPE 1		0.0	0.0	0.0	0.0	0.0
VC 1		8.92100-02	7.34000-02	7.45900-02	9.40000-02	5.59472-02
HCSOL 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
FREEZEPT 1		6.31490+01	5.43610+01	8.37800+01	2.16580+02	2.73150+02
CPIAPI 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
CPIGPO 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPIALEE 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	8.31447 00	8.31447 00	8.31447 00	8.31447 00	8.31447 00
	8	0.0	0.0	0.0	0.0	0.0
	9	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPITMLPO 1	1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	6.00000 00	6.00000 00	6.00000 00	6.00000 00	6.00000 00
		8	0.0	0.0	0.0	0.0	0.0
		9	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPIWEOS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
		9	0.0	0.0	0.0	0.0	0.0
		10	0.0	0.0	0.0	0.0	0.0
		11	8.31447 00	8.31447 00	8.31447 00	8.31447 00	8.31447 00
		12	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
		13	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CMPCLASS	1		1.00000+02	1.00000+02	1.00000+02	1.10000+02	1.00000+02
ZWITTER	1		0.0	0.0	0.0	0.0	0.0
RKTZRA	1		2.89970-01	2.89240-01	2.93100-01	2.72560-01	2.43172-01
VCRKT	1		8.92100-02	7.34000-02	7.45900-02	9.40000-02	5.59472-02
RACKET	1	1	3.08608-01	2.54854-01	2.56084-01	3.42585-01	2.43844-01
		2	2.89970-01	2.89240-01	2.93100-01	2.72560-01	2.43172-01
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MULAND	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	5.00000+02	5.00000+02	5.00000+02	5.00000+02	5.00000+02
MULDIP	1	1	1.60040+01	-4.14760 00	-8.86850 00	1.87750+01	-5.28430+01
		2	-1.81610+02	9.40400+01	2.04290+02	-4.02920+02	3.70360+03
		3	-5.15510 00	-1.20700 00	-3.83050-01	-4.68540 00	5.86600 00
		4	0.0	0.0	-1.29370-22	-6.91710-26	-5.87900-29
		5	0.0	0.0	1.00000+01	1.00000+01	1.00000+01
		6	6.31500+01	5.43600+01	8.37800+01	2.16580+02	2.73160+02
		7	1.24000+02	1.50000+02	1.50000+02	3.03150+02	6.46150+02
TRNSWT	1	1	1.01000+02	1.01000+02	1.01000+02	1.01000+02	1.01000+02
		2	1.02000+02	1.02000+02	1.02000+02	1.02000+02	1.02000+02
		3	1.00000+02	1.00000+02	1.00000+02	1.00000+02	1.00000+02
		4	1.02000+02	1.02000+02	1.02000+02	1.02000+02	1.02000+02
		5	1.06000+02	1.06000+02	1.06000+02	1.06000+02	1.06000+02
MULPDS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MULIKC	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MULPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MULNVE	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MULPPDS9	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KLDIP	1 1	2.65400-01	2.74100-01	1.81900-01	4.40600-01	-4.32000-01
	2	-1.67700-03	-1.38000-03	-3.17600-04	-1.21750-03	5.72550-03
	3	0.0	0.0	-4.11000-06	0.0	-8.07800-06
	4	0.0	0.0	0.0	0.0	1.86100-09
	5	0.0	0.0	0.0	0.0	0.0
	6	6.31500+01	6.00000+01	8.37800+01	2.16580+02	2.73160+02
	7	1.24000+02	1.50000+02	1.50000+02	3.00000+02	6.33150+02
KLPDS	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KLTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KLPPDS8	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	7.00000 00	7.00000 00	7.00000 00	7.00000 00	7.00000 00
	10	0.0	0.0	0.0	0.0	0.0
	11	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
VB	1	3.46723-02	2.80225-02	2.86156-02	3.50189-02	1.88311-02
MUP	1	0.0	0.0	0.0	0.0	5.84934-25
LJPAR	1 1	1.00693+02	1.22931+02	1.19406+02	2.52299+02	MISSING
	2	3.65722-10	3.43317-10	3.44150-10	3.76074-10	MISSING
STKPAR	1 1	9.12659+01	1.06422+02	1.02990+02	2.29746+02	9.51082+02
	2	3.80193-10	3.54143-10	3.56624-10	3.81456-10	2.39967-10
DVBLNC	1	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
DLWC	1	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
CHI	1	0.0	0.0	0.0	0.0	0.0
SIGDIP	1 1	2.90100-02	3.80660-02	3.82300-02	8.07100-02	1.77660-01
	2	1.24850 00	1.21360 00	1.29270 00	1.26620 00	2.56700 00
	3	0.0	0.0	0.0	0.0	-3.33770 00
	4	0.0	0.0	0.0	0.0	1.96990 00
	5	0.0	0.0	0.0	0.0	0.0
	6	6.31500+01	5.43500+01	8.37800+01	2.16580+02	2.73160+02
	7	1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47100+02
SIGPDS	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
SIGPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
SIGISTE	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	7	0.0	0.0	0.0	0.0	0.0
	8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
SIGPDS14	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	MISSING	MISSING	MISSING	MISSING	MISSING
	5	0.0	0.0	0.0	0.0	0.0
	6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
SIGTDEW	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	7	0.0	0.0	0.0	0.0	0.0
	8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
VKGRP	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	MISSING	MISSING	MISSING	MISSING	MISSING
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	MISSING	MISSING	MISSING	MISSING	MISSING
	7	MISSING	MISSING	MISSING	MISSING	MISSING
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	MISSING	MISSING	MISSING	MISSING	MISSING
	10	MISSING	MISSING	MISSING	MISSING	MISSING
	11	MISSING	MISSING	MISSING	MISSING	MISSING
	12	MISSING	MISSING	MISSING	MISSING	MISSING
	13	MISSING	MISSING	MISSING	MISSING	MISSING
	14	MISSING	MISSING	MISSING	MISSING	MISSING
	15	MISSING	MISSING	MISSING	MISSING	MISSING
	16	MISSING	MISSING	MISSING	MISSING	MISSING
	17	MISSING	MISSING	MISSING	MISSING	MISSING
	18	MISSING	MISSING	MISSING	MISSING	MISSING
	19	MISSING	MISSING	MISSING	MISSING	MISSING
	20	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

	21	MISSING	MISSING	MISSING	MISSING	MISSING
	22	MISSING	MISSING	MISSING	MISSING	MISSING
	23	MISSING	MISSING	MISSING	MISSING	MISSING
	24	MISSING	MISSING	MISSING	MISSING	MISSING
DHFVK	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGFVK	1	MISSING	MISSING	MISSING	MISSING	MISSING
DHFVKM	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGFVKM	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGCON	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGCONM	1	MISSING	MISSING	MISSING	MISSING	MISSING
DHCON	1	MISSING	MISSING	MISSING	MISSING	MISSING
DHCONM	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGSUB	1	MISSING	MISSING	MISSING	MISSING	MISSING
DGSUBM	1	MISSING	MISSING	MISSING	MISSING	MISSING
DHSUB	1	MISSING	MISSING	MISSING	MISSING	MISSING
DHSUBM	1	MISSING	MISSING	MISSING	MISSING	MISSING
THRSWT	1 1	1.00000+02	1.00000+02	1.00000+02	1.00000+02	1.00000+02
	2	1.05000+02	1.05000+02	1.05000+02	1.05000+02	1.16000+02
	3	1.01000+02	1.01000+02	1.01000+02	1.01000+02	1.01000+02
	4	1.06000+02	1.06000+02	1.06000+02	1.06000+02	1.06000+02
	5	1.00000+02	1.00000+02	0.0	1.00000+02	1.00000+02
	6	1.00000+02	1.00000+02	1.00000+02	1.00000+02	1.00000+02
	7	1.07000+02	1.07000+02	1.00000+02	1.07000+02	1.07000+02
	8	1.04000+02	1.04000+02	1.04000+02	1.04000+02	1.04000+02
NATOM	1 1	0.0	0.0	0.0	1.00000 00	0.0
	2	0.0	0.0	0.0	0.0	2.00000 00
	3	0.0	2.00000 00	0.0	2.00000 00	1.00000 00
	4	2.00000 00	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	1.00000 00	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
DHAQFM	1	0.0	-1.17000+07	-1.21000+07	-4.13800+08	0.0
HCOM	1	0.0	0.0	0.0	0.0	0.0
CPLXP1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPLXP2	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
PLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
LNVPEQ	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
LNVP1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
LOGVP1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
LNPR1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
LOGPR1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
LNPR2	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
LOGPR2	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
PLTDEPOL	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	0.0	0.0	0.0	0.0	0.0
		9	0.0	0.0	0.0	0.0	0.0
		10	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
WAGNER25	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	MISSING	MISSING	MISSING	MISSING	MISSING
		7	0.0	0.0	0.0	0.0	0.0
		8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPIGHY	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
		8	MISSING	MISSING	MISSING	MISSING	MISSING
DNLDIP	1	1	3.20910 00	3.91430 00	3.84690 00	2.76800 00	1.78630+01
		2	2.86100-01	2.87720-01	2.88100-01	2.62120-01	5.86060+01
		3	1.26200+02	1.54580+02	1.50860+02	3.04210+02	-9.53960+01
		4	2.96600-01	2.92400-01	2.97830-01	2.90800-01	2.13890+02
		5	0.0	0.0	0.0	0.0	-1.41260+02
		6	6.31500+01	5.43500+01	8.37800+01	2.16580+02	2.73160+02
		7	1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47100+02
DNLPDS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
RHOM	1		0.0	0.0	0.0	0.0	0.0
VLPO	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNLCOSTD	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNLEXSAT	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	6.00000 00	6.00000 00	6.00000 00	6.00000 00	6.00000 00
	10	0.0	0.0	0.0	0.0	0.0
	11	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNLTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNLRACK	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
PSANT	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
PSTDEPOL	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
PSTMLPOL	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	8.00000 00	8.00000 00	8.00000 00	8.00000 00	8.00000 00
	10	0.0	0.0	0.0	0.0	0.0
	11	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPSPO1	1 1	MISSING	MISSING	MISSING	MISSING	3.81518+03
	2	0.0	0.0	0.0	0.0	1.25816+02
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	-8.65820+04
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	5.00000+01
	8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	3.00000+02
DHSFRM	1	0.0	0.0	0.0	0.0	-2.92920+08
CPSDIP	1 1	2.74200+04	-1.38000+04	MISSING	-1.82820+04	-2.62490+02
	2	1.70100+02	1.37900+03	0.0	1.36030+03	1.40520+02
	3	2.21250 00	0.0	0.0	-1.21520+01	0.0
	4	0.0	0.0	0.0	5.15800-02	0.0
	5	0.0	0.0	0.0	-7.69900-05	0.0
	6	3.70000+01	1.34600+01	0.0	2.50000+01	3.15000 00
	7	6.30000+01	4.37800+01	1.00000+03	2.16580+02	2.73150+02
CPSXP1	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPSXP2	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	10	0.0	0.0	0.0	0.0	0.0
CPSXP3	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPSXP4	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPSXP5	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPSXP6	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
CPSXP7	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	10	0.0	0.0	0.0	0.0	0.0
TREFHS	1	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
CPSPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPSTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	5.00000 00	5.00000 00	5.00000 00	5.00000 00	5.00000 00
	7	0.0	0.0	0.0	0.0	0.0
	8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DGSFRM	1	0.0	0.0	0.0	0.0	-2.36760+08
VSPOLY	1 1	MISSING	MISSING	MISSING	MISSING	1.96500-02
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNSDIP	1 1	3.78700+01	4.45520+01	4.43330+01	3.29390+01	5.30300+01
	2	-6.02720-02	0.0	0.0	6.84200-02	-7.84090-03
	3	0.0	0.0	0.0	-2.84700-04	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	2.06500+01	2.06500+01	0.0	1.43100+02	2.33150+02
	7	6.31500+01	2.06500+01	0.0	2.16580+02	2.73150+02
VSPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNSTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	8.00000 00	8.00000 00	8.00000 00	8.00000 00	8.00000 00
	10	0.0	0.0	0.0	0.0	0.0
	11	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KSPOLY	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
UFGRPD	1 1	3.82000+03	3.83000+03	3.87000+03	3.85000+03	1.30000+03
	2	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	MISSING	MISSING	MISSING	MISSING	MISSING
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	MISSING	MISSING	MISSING	MISSING	MISSING
	7	MISSING	MISSING	MISSING	MISSING	MISSING
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	MISSING	MISSING	MISSING	MISSING	MISSING
	10	MISSING	MISSING	MISSING	MISSING	MISSING
	11	MISSING	MISSING	MISSING	MISSING	MISSING
	12	MISSING	MISSING	MISSING	MISSING	MISSING
	13	MISSING	MISSING	MISSING	MISSING	MISSING
	14	MISSING	MISSING	MISSING	MISSING	MISSING
	15	MISSING	MISSING	MISSING	MISSING	MISSING
	16	MISSING	MISSING	MISSING	MISSING	MISSING
	17	MISSING	MISSING	MISSING	MISSING	MISSING
	18	MISSING	MISSING	MISSING	MISSING	MISSING
	19	MISSING	MISSING	MISSING	MISSING	MISSING
	20	MISSING	MISSING	MISSING	MISSING	MISSING
	21	MISSING	MISSING	MISSING	MISSING	MISSING
	22	MISSING	MISSING	MISSING	MISSING	MISSING
	23	MISSING	MISSING	MISSING	MISSING	MISSING
	24	MISSING	MISSING	MISSING	MISSING	MISSING
UFGRPL	1 1	3.82000+03	3.83000+03	3.87000+03	3.85000+03	1.30000+03
	2	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	MISSING	MISSING	MISSING	MISSING	MISSING
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	MISSING	MISSING	MISSING	MISSING	MISSING
	7	MISSING	MISSING	MISSING	MISSING	MISSING
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

	10	MISSING	MISSING	MISSING	MISSING	MISSING
	11	MISSING	MISSING	MISSING	MISSING	MISSING
	12	MISSING	MISSING	MISSING	MISSING	MISSING
	13	MISSING	MISSING	MISSING	MISSING	MISSING
	14	MISSING	MISSING	MISSING	MISSING	MISSING
	15	MISSING	MISSING	MISSING	MISSING	MISSING
	16	MISSING	MISSING	MISSING	MISSING	MISSING
	17	MISSING	MISSING	MISSING	MISSING	MISSING
	18	MISSING	MISSING	MISSING	MISSING	MISSING
	19	MISSING	MISSING	MISSING	MISSING	MISSING
	20	MISSING	MISSING	MISSING	MISSING	MISSING
	21	MISSING	MISSING	MISSING	MISSING	MISSING
	22	MISSING	MISSING	MISSING	MISSING	MISSING
	23	MISSING	MISSING	MISSING	MISSING	MISSING
	24	MISSING	MISSING	MISSING	MISSING	MISSING
UFGRP	1 1	3.82000+03	3.83000+03	3.87000+03	3.85000+03	1.30000+03
	2	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
	3	MISSING	MISSING	MISSING	MISSING	MISSING
	4	MISSING	MISSING	MISSING	MISSING	MISSING
	5	MISSING	MISSING	MISSING	MISSING	MISSING
	6	MISSING	MISSING	MISSING	MISSING	MISSING
	7	MISSING	MISSING	MISSING	MISSING	MISSING
	8	MISSING	MISSING	MISSING	MISSING	MISSING
	9	MISSING	MISSING	MISSING	MISSING	MISSING
	10	MISSING	MISSING	MISSING	MISSING	MISSING
	11	MISSING	MISSING	MISSING	MISSING	MISSING
	12	MISSING	MISSING	MISSING	MISSING	MISSING
	13	MISSING	MISSING	MISSING	MISSING	MISSING
	14	MISSING	MISSING	MISSING	MISSING	MISSING
	15	MISSING	MISSING	MISSING	MISSING	MISSING
	16	MISSING	MISSING	MISSING	MISSING	MISSING
	17	MISSING	MISSING	MISSING	MISSING	MISSING
	18	MISSING	MISSING	MISSING	MISSING	MISSING
	19	MISSING	MISSING	MISSING	MISSING	MISSING
	20	MISSING	MISSING	MISSING	MISSING	MISSING
	21	MISSING	MISSING	MISSING	MISSING	MISSING
	22	MISSING	MISSING	MISSING	MISSING	MISSING
	23	MISSING	MISSING	MISSING	MISSING	MISSING
	24	MISSING	MISSING	MISSING	MISSING	MISSING
DELTA	1	5.72927+03	8.18467+03	1.09061+04	1.02308+04	3.68310+04
GMSHVL	1	3.24037-02	3.29772-02	5.70635-02	4.10498-02	7.08225-02
VLCVT1	1	2.53400-03	2.87100-03	4.90700-03	4.75100-03	1.00000-02
DHVLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

		9	0.0	0.0	0.0	0.0	0.0
		10	0.0	0.0	0.0	0.0	0.0
		11	0.0	0.0	0.0	0.0	0.0
		12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
GMSHSP	1		MISSING	MISSING	MISSING	MISSING	MISSING
DHVLTDEW	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	MISSING	MISSING	MISSING	MISSING	MISSING
		6	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
		7	0.0	0.0	0.0	0.0	0.0
		8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
TCLKP	1		1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47096+02
PCLKP	1		3.40000+06	5.04300+06	4.89800+06	7.38300+06	2.20640+07
OMGLKP	1		3.77215-02	2.21798-02	0.0	2.23621-01	3.44861-01
LKPZC	1		2.87294-01	2.88615-01	2.90500-01	2.71492-01	2.61187-01
VCLKP	1		8.92100-02	7.34000-02	7.45900-02	9.40000-02	5.59472-02
PCSFTM	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFTU	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFTV	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFTR	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFAU	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFAV	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFMU	1		MISSING	MISSING	MISSING	MISSING	MISSING
PCSFXP	1		MISSING	MISSING	MISSING	MISSING	MISSING
PVISC	1		MISSING	MISSING	MISSING	MISSING	MISSING
KLVKL	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	MISSING	MISSING	MISSING	MISSING	MISSING
		6	MISSING	MISSING	MISSING	MISSING	MISSING
		7	MISSING	MISSING	MISSING	MISSING	MISSING
		8	MISSING	MISSING	MISSING	MISSING	MISSING
		9	MISSING	MISSING	MISSING	MISSING	MISSING
KLVKG	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	MISSING	MISSING	MISSING	MISSING	MISSING
		6	MISSING	MISSING	MISSING	MISSING	MISSING
		7	MISSING	MISSING	MISSING	MISSING	MISSING
		8	MISSING	MISSING	MISSING	MISSING	MISSING
		9	MISSING	MISSING	MISSING	MISSING	MISSING
KLVKC	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	MISSING	MISSING	MISSING	MISSING	MISSING

PARAMETER VALUES (CONTINUED)

		6	MISSING	MISSING	MISSING	MISSING	MISSING
		7	MISSING	MISSING	MISSING	MISSING	MISSING
		8	MISSING	MISSING	MISSING	MISSING	MISSING
		9	MISSING	MISSING	MISSING	MISSING	MISSING
TGVK	1		MISSING	MISSING	MISSING	MISSING	MISSING
TMVK	1		MISSING	MISSING	MISSING	MISSING	MISSING
POLCRY	1		0.0	0.0	0.0	0.0	0.0
TCTRAP	1		1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47096+02
PCTRAP	1		3.40000+06	5.04300+06	4.89800+06	7.38300+06	2.20640+07
VCTRAP	1		8.92100-02	7.34000-02	7.45900-02	9.40000-02	5.59472-02
ZCTRAP	1		2.89000-01	2.88000-01	2.91000-01	2.74000-01	2.29000-01
OMGRAP	1		3.77215-02	2.21798-02	0.0	2.23621-01	3.44861-01
CRITMW	1		MISSING	MISSING	MISSING	MISSING	MISSING
MULMH	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	3.40000 00	3.40000 00	3.40000 00	3.40000 00	3.40000 00
		4	1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
		5	0.0	0.0	0.0	0.0	0.0
		6	MISSING	MISSING	MISSING	MISSING	MISSING
		7	MISSING	MISSING	MISSING	MISSING	MISSING
POLPDI	1		1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
HMUVK	1		MISSING	MISSING	MISSING	MISSING	MISSING
CPLDIP	1	1	2.81970+05	1.75430+05	1.34390+05	-8.30430+06	2.76370+05
		2	-1.22810+04	-6.15230+03	-1.98940+03	1.04370+05	-2.09010+03
		3	2.48000+02	1.13920+02	1.10430+01	-4.33330+02	8.12500 00
		4	-2.21820 00	-9.23820-01	0.0	6.00520-01	-1.41160-02
		5	7.49020-03	2.79630-03	0.0	0.0	9.37010-06
		6	6.31500+01	5.43600+01	8.37800+01	2.20000+02	2.73160+02
		7	1.12000+02	1.42000+02	1.35000+02	2.90000+02	5.33150+02
TREFHL	1		MISSING	MISSING	MISSING	MISSING	MISSING
COMPHL	1		MISSING	MISSING	MISSING	MISSING	MISSING
POLDP	1		1.00000 00	1.00000 00	1.00000 00	1.00000 00	1.00000 00
CPCVK	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLVK	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLVKM	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03

PARAMETER VALUES (CONTINUED)

CPCVKM	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	MISSING	MISSING	MISSING	MISSING	MISSING
		5	0.0	0.0	0.0	0.0	0.0
		6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLPDS	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	0.0	0.0	0.0	0.0	0.0
		3	0.0	0.0	0.0	0.0	0.0
		4	0.0	0.0	0.0	0.0	0.0
		5	0.0	0.0	0.0	0.0	0.0
		6	0.0	0.0	0.0	0.0	0.0
		7	0.0	0.0	0.0	0.0	0.0
		8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
VOLVW	1		MISSING	MISSING	MISSING	MISSING	MISSING
DNLVK	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	0.0	0.0	0.0	0.0	0.0
		4	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNCVK	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	0.0	0.0	0.0	0.0	0.0
		4	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNGVK	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	0.0	0.0	0.0	0.0	0.0
		5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNLVKM	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	0.0	0.0	0.0	0.0	0.0
		4	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNCVKM	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	0.0	0.0	0.0	0.0	0.0
		4	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DNGVKM	1	1	MISSING	MISSING	MISSING	MISSING	MISSING
		2	MISSING	MISSING	MISSING	MISSING	MISSING
		3	MISSING	MISSING	MISSING	MISSING	MISSING
		4	0.0	0.0	0.0	0.0	0.0
		5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
DHVLDP	1	1	7.49050+06	9.00800+06	8.42150+06	2.17300+07	5.66000+07
		2	4.04060-01	4.54200-01	2.83330-01	3.82000-01	6.12040-01
		3	-3.17000-01	-4.09600-01	3.32810-02	-4.33900-01	-6.25700-01
		4	2.73430-01	3.18300-01	3.05510-02	4.22130-01	3.98800-01
		5	0.0	0.0	0.0	0.0	0.0
		6	6.31500+01	5.43600+01	8.37800+01	2.16580+02	2.73160+02
		7	1.26200+02	1.54580+02	1.50860+02	3.04210+02	6.47100+02
DHVLB	1		5.56831+06	6.78526+06	6.42697+06	1.63703+07	4.06937+07
MUVDIP	1	1	6.55920-07	1.10100-06	9.21210-07	2.14800-06	1.70960-08

PARAMETER VALUES (CONTINUED)

	2	6.08100-01	5.63400-01	6.05290-01	4.60000-01	1.11460 00
	3	5.47140+01	9.63000+01	8.32400+01	2.90000+02	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	6.31500+01	5.43500+01	8.37800+01	1.94670+02	2.73160+02
	7	1.97000+03	1.50000+03	3.27310+03	1.50000+03	1.07315+03
MUVPDS	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MUVCEB	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	MISSING	MISSING	MISSING	MISSING	MISSING
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MUVSUT	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MUVPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
MUVTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KVDIP	1 1	3.31430-04	4.49940-04	6.33000-04	3.69000 00	6.20410-06
	2	7.72200-01	7.45600-01	6.22100-01	-3.83800-01	1.39730 00
	3	1.63230+01	5.66990+01	7.00000+01	9.64000+02	0.0
	4	3.73720+02	0.0	0.0	1.86000+06	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	6.31500+01	8.00000+01	9.00000+01	1.94670+02	2.73160+02
	7	2.00000+03	2.00000+03	3.27310+03	1.50000+03	1.07315+03
KVPDS	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

	5	0.0	0.0	0.0	0.0	0.0
	6	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
KVPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	0.0	0.0	0.0	0.0	0.0
	8	0.0	0.0	0.0	0.0	0.0
	9	0.0	0.0	0.0	0.0	0.0
	10	0.0	0.0	0.0	0.0	0.0
	11	0.0	0.0	0.0	0.0	0.0
	12	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLIKC	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLTDECS	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	MISSING	MISSING	MISSING	MISSING	MISSING
	7	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	8	0.0	0.0	0.0	0.0	0.0
	9	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
CPLTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0
	6	5.00000 00	5.00000 00	5.00000 00	5.00000 00	5.00000 00
	7	0.0	0.0	0.0	0.0	0.0
	8	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03

PARAMETER VALUES (CONTINUED)

KVTMLPO	1 1	MISSING	MISSING	MISSING	MISSING	MISSING
	2	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	4.00000 00	4.00000 00	4.00000 00	4.00000 00	4.00000 00
	6	0.0	0.0	0.0	0.0	0.0
	7	1.00000+03	1.00000+03	1.00000+03	1.00000+03	1.00000+03
VLBROC	1 1	8.96408-02	7.33611-02	7.48588-02	9.39446-02	5.59472-02
	2	0.0	0.0	0.0	0.0	0.0

CONVENTIONAL COMPONENT - BINARY PARAMETER TABLES

TABLE FOR RKTKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	MISSING	MISSING	MISSING	MISSING	MISSING
OXYGE-01	MISSING	MISSING	MISSING	MISSING	MISSING
ARGON	MISSING	MISSING	MISSING	MISSING	MISSING
CARBO-01	MISSING	MISSING	MISSING	MISSING	MISSING
WATER	MISSING	MISSING	MISSING	MISSING	MISSING

TABLE FOR ANDKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR ANDKIJ SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR ANDMIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR ANDMIJ SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MLQKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MUKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MUKIJ SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MUKIJ SET = 1 ELEMENT = 3

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MUKIJ SET = 1 ELEMENT = 4

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MUKIJ SET = 1 ELEMENT = 5

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

TABLE FOR MUKIJ SET = 1 ELEMENT = 6

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
OXYGE-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
ARGON	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
CARBO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
WATER	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02

TABLE FOR MULIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MULIJ SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MULIJ SET = 1 ELEMENT = 3

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MULIJ SET = 1 ELEMENT = 4

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MULIJ SET = 1 ELEMENT = 5

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR MULIJ SET = 1 ELEMENT = 6

PARAMETER VALUES (CONTINUED)

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
OXYGE-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
ARGON	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
CARBO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
WATER	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02

TABLE FOR GMSHXL SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR LKPKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	MISSING	-8.90000-03	-1.52000-02	1.07400-01	MISSING
OXYGE-01	-8.90000-03	MISSING	-1.44000-02	MISSING	MISSING
ARGON	-1.52000-02	-1.44000-02	MISSING	MISSING	MISSING
CARBO-01	1.07400-01	MISSING	MISSING	MISSING	-6.33000-02
WATER	MISSING	MISSING	MISSING	-6.33000-02	MISSING

TABLE FOR PCSKIJ SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR PCSKIJ SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR PCSKIJ SET = 1 ELEMENT = 3

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR PCSKIJ SET = 1 ELEMENT = 4

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0

PARAMETER VALUES (CONTINUED)

OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR PCSKIJ SET = 1 ELEMENT = 5

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR PCSKIJ SET = 1 ELEMENT = 6

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
OXYGE-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
ARGON	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
CARBO-01	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02
WATER	2.98150+02	2.98150+02	2.98150+02	2.98150+02	2.98150+02

TABLE FOR HENRY SET = 1 ELEMENT = 1

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	MISSING	MISSING	MISSING	MISSING	1.76507+02
OXYGE-01	MISSING	MISSING	MISSING	MISSING	1.55921+02
ARGON	MISSING	MISSING	MISSING	MISSING	1.80991+02
CARBO-01	MISSING	MISSING	MISSING	MISSING	1.71378+02
WATER	MISSING	MISSING	MISSING	MISSING	MISSING

TABLE FOR HENRY SET = 1 ELEMENT = 2

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	-8.43277+03
OXYGE-01	0.0	0.0	0.0	0.0	-7.77506+03
ARGON	0.0	0.0	0.0	0.0	-8.13713+03
CARBO-01	0.0	0.0	0.0	0.0	-8.74155+03
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR HENRY SET = 1 ELEMENT = 3

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	-2.15580+01
OXYGE-01	0.0	0.0	0.0	0.0	-1.83974+01
ARGON	0.0	0.0	0.0	0.0	-2.32547+01
CARBO-01	0.0	0.0	0.0	0.0	-2.16690+01
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR HENRY SET = 1 ELEMENT = 4

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	-8.43624-03
OXYGE-01	0.0	0.0	0.0	0.0	-9.44354-03
ARGON	0.0	0.0	0.0	0.0	3.06357-03

PARAMETER VALUES (CONTINUED)

CARBO-01	0.0	0.0	0.0	0.0	1.10259-03
WATER	0.0	0.0	0.0	0.0	0.0

TABLE FOR HENRY SET = 1 ELEMENT = 5

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	2.73000+02
OXYGE-01	0.0	0.0	0.0	0.0	2.74000+02
ARGON	0.0	0.0	0.0	0.0	2.74000+02
CARBO-01	0.0	0.0	0.0	0.0	2.73000+02
WATER	2.73000+02	2.74000+02	2.74000+02	2.73000+02	0.0

TABLE FOR HENRY SET = 1 ELEMENT = 6

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	2.00000+03	2.00000+03	2.00000+03	2.00000+03	3.46000+02
OXYGE-01	2.00000+03	2.00000+03	2.00000+03	2.00000+03	3.48000+02
ARGON	2.00000+03	2.00000+03	2.00000+03	2.00000+03	3.47000+02
CARBO-01	2.00000+03	2.00000+03	2.00000+03	2.00000+03	3.53000+02
WATER	3.46000+02	3.48000+02	3.47000+02	3.53000+02	2.00000+03

TABLE FOR HENRY SET = 1 ELEMENT = 7

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0	0.0	0.0	0.0	0.0
OXYGE-01	0.0	0.0	0.0	0.0	0.0
ARGON	0.0	0.0	0.0	0.0	0.0
CARBO-01	0.0	0.0	0.0	0.0	0.0
WATER	0.0	0.0	0.0	0.0	0.0

PROPERTY PARAMETERS

PARAMETERS ACTUALLY USED IN THE SIMULATION

PURE COMPONENT PARAMETERS

COMPONENT ID: NITRO-01
FORMULA: N2 NAME: N2

SCALAR PARAMETERS

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
API	1	STANDARD API GRAVITY	340.00		PURE28
CHARGE	1	IONIC CHARGE	0.0000		AQUEOUS
CHI	1	STIEL POLAR FACTOR	0.0000		DEFAULT
CMPCLASS	1	COMPONET CLASS INDEX	100.00		DEFAULT
DELTA	1	SOLUBILITY PARAMETER AT 25 C	5729.3	(J/CUM)**.5	PURE28
DGFORM	1	IDEAL GAS GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	PURE28
DGSFRM	1	SOLID GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHAQFM	1	AQUEOUS INFINITE DILUTION ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHFORM	1	IDEAL GAS ENTHALPY OF FORMATION	0.0000	J/KMOL	PURE28
DHSFRM	1	SOLID ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHVLB	1	ENTHALPY OF VAPORIZATION AT TB	0.55683E+07	J/KMOL	PURE28
DLWC	1	WILKE-CHANG DIFFUSING-COMPONENT FLAG	1.0000		DEFAULT
DVBLNC	1	CHAPMAN-ENSKOG-WILKE-LEE DIFFUSING COMPONENT FLAG	1.0000		DEFAULT

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
FREEZEPT	1		-210.00	C	PURE28
GMSHVL	1	SCATCHARD-HILDEBRAND LIQUID VOLUME AT 25 C	0.32404E-01	CUM/KMOL	DEFAULT
HCOM	1	STANDARD ENTHALPY OF COMBUSTION AT 25 C	0.0000	J/KMOL	DEFAULT
HCTYPE	1	HYDROCARBON COMPONET CLASS INDEX	0.0000		DEFAULT
LKPZC	1	ZC FOR LEE-KESLER-PLOCKER EOS	0.28729		DEFAULT
MUP	1	DIPOLE MOMENT	0.0000	(J*CUM)**.5	PURE28
MW	1	MOLECULAR WEIGHT	28.013		PURE28
OMEGA	1	PITZER ACENTRIC FACTOR	0.37721E-01		PURE28
OMGLKP	1	OMEGA FOR LEE KESLER PLOCKER EOS	0.37721E-01		DEFAULT
OMGRAP	1	OMEGA FOR TRAPP MODEL	0.37721E-01		DEFAULT
PC	1	CRITICAL PRESSURE	0.34000E+07	PA	PURE28
PCLKP	1	PC FOR LEE-KESLER-PLOCKER EOS	0.34000E+07	PA	DEFAULT
PCTRAP	1	PC FOR TRAPP MODEL	0.34000E+07	PA	DEFAULT
POLCRY	1	POLYMER CRYSTALLINITY	0.0000		DEFAULT
POLDP	1	DEGREE OF POLYMERIZATION	1.0000		DEFAULT
POLPDI	1	POLYDISPERSITY INDEX	1.0000		DEFAULT
RHOM	1	MASS DENSITY	0.0000	KG/CUM	DEFAULT
RKTZRA	1	RACKETT PARAMETER	0.28997		PURE28
S025E	1	SUM OF ELEMENT ENTROPIES AT 25 C	0.19161E+06	J/KMOL-K	AQUEOUS

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
SG	1	STANDARD SPECIFIC GRAVITY AT 60 F	0.30000		PURE28
TB	1	NORMAL BOILING POINT	-195.81	C	PURE28
TC	1	CRITICAL TEMPERATURE	-146.95	C	PURE28
TCLKP	1	TC FOR LEE-KESLER-PLOCKER EOS	-146.95	C	DEFAULT
TCTRAP	1	TC FOR TRAPP MODEL	-146.95	C	DEFAULT
TREFHS	1	REFERENCE TEMPERATURE FOR SOLID REFERENCE STATE	25.000	C	DEFAULT
VB	1	LIQUID MOLAR VOLUME AT TB	0.34672E-01	CUM/KMOL	PURE28
VC	1	CRITICAL VOLUME	0.89210E-01	CUM/KMOL	PURE28
VCLKP	1	VC FOR LEE-KESLER-PLOCKER EOS	0.89210E-01	CUM/KMOL	DEFAULT
VCRKT	1	VC FOR RACKETT MODEL	0.89210E-01	CUM/KMOL	DEFAULT
VCTRAP	1	VC FOR TRAPP MODEL	0.89210E-01	CUM/KMOL	DEFAULT
VLCVT1	1	CHARACTERISTIC VOLUME FOR SCATCHARD-HILDEBRAND	0.25340E-02	CUM/KMOL	PURE28
VLSTD	1	API STANDARD LIQUID MOLAR VOLUME AT 60 F	0.53558E-01	CUM/KMOL	PURE28
ZC	1	CRITICAL COMPRESSIBILITY FACTOR	0.28900		PURE28
ZCTRAP	1	ZC FOR TRAPP MODEL	0.28900		DEFAULT
ZWITTER	1	ZWITTERIONS IDENTIFIER	0.0000		DEFAULT

PROPERTY PARAMETERS (CONTINUED)

TEMPERATURE DEPENDENT PARAMETERS

CPIGDP DIPPR ideal gas heat capacity

CPIGDP = A + B(C/T/SINH(C/T))^2 + D(E/T/COSH(E/T))^2

TEMP UNITS: K PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	29105.0		
B	=	8614.90		
C	=	1701.60		
D	=	103.470		
E	=	909.790		
T RANGE	=	50.00	TO	1500.00 K

CPLDIP DIPPR liquid heat capacity

CPLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	0.119204E+08		
B	=	237296.		
C	=	1783.40		
D	=	5.96559		
E	=	0.749020E-02		
T RANGE	=	-210.00	TO	-161.15 C

CPSDIP DIPPR solid heat capacity

CPSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	238959.		
B	=	1378.79		
C	=	2.21250		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-236.15	TO	-210.15 C

DHVLDP DIPPR heat of vaporization

DHVLDP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: J/KMOL

SET: 1 SOURCE: PURE28

A	=	0.749050E+07		
B	=	0.404060		
C	=	-0.317000		
D	=	0.273430		
E	=	0.00000		
T RANGE	=	-210.00	TO	-146.95 C

DNLDIP DIPPR liquid density

DNLDIP = A/(B^(1 + (1 - T/C)^D))

TEMP UNITS: K PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	3.20910		
B	=	0.286100		
C	=	126.200		
D	=	0.296600		
E	=	0.00000		
T RANGE	=	63.15	TO	126.20 K

PROPERTY PARAMETERS (CONTINUED)

DNSDIP DIPPR solid density

DNSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	21.4067		
B	=	-0.602720E-01		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE =	-252.50	TO	-210.00	C

KLDIP DIPPR liquid thermal conductivity

KLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	-0.192673		
B	=	-0.167700E-02		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE =	-210.00	TO	-149.15	C

KVDIP DIPPR vapor thermal conductivity

KVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.331430E-03		
B	=	0.772200		
C	=	16.3230		
D	=	373.720		
E	=	0.00000		
T RANGE =	63.15	TO	2000.00	K

PROPERTY PARAMETERS (CONTINUED)

MULDIP DIPPR liquid viscosity

LN(MULDIP) = A + B/T + C LN(T) + DT^E

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	16.0040		
B	=	-181.610		
C	=	-5.15510		
D	=	0.00000		
E	=	0.00000		
T RANGE =	63.15	TO	124.00	K

MUVDIP DIPPR vapor viscosity

MUVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	0.655920E-06		
B	=	0.608100		
C	=	54.7140		
D	=	0.00000		
E	=	0.00000		
T RANGE =	63.15	TO	1970.00	K

PLXANT EXTENDED ANTOINE VAPOR PRESSURE

LN(PL) = A + B/(T + C) + DT + E LN(T) + FT^G

TEMP UNITS: K PROP UNITS: PA

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	58.2820		
B	=	-1084.10		
C	=	0.00000		
D	=	0.00000		
E	=	-8.31440		
F	=	0.441270E-01		
G	=	1.00000		
T RANGE	=	63.15	TO	126.20 K

SIGDIP DIPPR liquid surface tension

SIGDIP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: N/M

SET: 1 SOURCE: PURE28

A	=	0.290100E-01		
B	=	1.24850		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-210.00	TO	-146.95 C

VLBROC BRELVI-O-CONNELL
VOLUME PARAMETER

TEMP UNITS: C PROP UNITS: CUM/KMOL

SET: 1 SOURCE: AQUEOUS

A	=	0.896408E-01
B	=	0.00000

WATSOL WATER SOLUBILITY

LN(XWSOL) = A + B/T + CT

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	-5.30000		
B	=	-500.000		
C	=	0.00000		
T RANGE	=	200.00	TO	373.00

VECTOR PARAMETERS

ATOMNO ATOMIC NUMBER OF ALL ELEMENTS

SET: 1 SOURCE: PURE28

A	=	7.00000

NOATOM NUMBER OF OCCURENCES FOR EACH TYPE OF ELEMENT

SET: 1 SOURCE: PURE28

A	=	2.00000

UFGRP UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3820.00	1.00000

UFGRPD DORTMUND-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3820.00	1.00000

UFGRPL LYNGBY-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3820.00	1.00000

PROPERTY PARAMETERS (CONTINUED)

PURE COMPONENT PARAMETERS

COMPONENT ID: OXYGE-01
FORMULA: O2 NAME: O2

SCALAR PARAMETERS

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
API	1	STANDARD API GRAVITY	340.00		PURE28
CHARGE	1	IONIC CHARGE	0.0000		AQUEOUS
CHI	1	STIEL POLAR FACTOR	0.0000		DEFAULT
CMPCLASS	1	COMPONET CLASS INDEX	100.00		DEFAULT
DELTA	1	SOLUBILITY PARAMETER AT 25 C	8184.7	(J/CUM)**.5	PURE28
DGFORM	1	IDEAL GAS GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	PURE28
DGSFRM	1	SOLID GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHAQFM	1	AQUEOUS INFINITE DILUTION ENTHALPY OF FORMATION	-0.11700E+08	J/KMOL	AQUEOUS
DHFORM	1	IDEAL GAS ENTHALPY OF FORMATION	0.0000	J/KMOL	PURE28
DHSFRM	1	SOLID ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHVLB	1	ENTHALPY OF VAPORIZATION AT TB	0.67853E+07	J/KMOL	PURE28
DLWC	1	WILKE-CHANG DIFFUSING-COMPONENT FLAG	1.0000		DEFAULT
DVBLNC	1	CHAPMAN-ENSKOG-WILKE-LEE DIFFUSING COMPONENT FLAG	1.0000		DEFAULT
FREEZEPT	1		-218.79	C	PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
GMSHVL	1	SCATCHARD-HILDEBRAND LIQUID VOLUME AT 25 C	0.32977E-01	CUM/KMOL	DEFAULT
HCOM	1	STANDARD ENTHALPY OF COMBUSTION AT 25 C	0.0000	J/KMOL	PURE28
HCTYPE	1	HYDROCARBON COMPONET CLASS INDEX	0.0000		DEFAULT
LKPZC	1	ZC FOR LEE-KESLER-PLOCKER EOS	0.28861		DEFAULT
MUP	1	DIPOLE MOMENT	0.0000	(J*CUM)**.5	PURE28
MW	1	MOLECULAR WEIGHT	31.999		PURE28
OMEGA	1	PITZER ACENTRIC FACTOR	0.22180E-01		PURE28
OMGLKP	1	OMEGA FOR LEE KESLER PLOCKER EOS	0.22180E-01		DEFAULT
OMGRAP	1	OMEGA FOR TRAPP MODEL	0.22180E-01		DEFAULT
PC	1	CRITICAL PRESSURE	0.50430E+07	PA	PURE28
PCLKP	1	PC FOR LEE-KESLER-PLOCKER EOS	0.50430E+07	PA	DEFAULT
PCTRAP	1	PC FOR TRAPP MODEL	0.50430E+07	PA	DEFAULT
POLCRY	1	POLYMER CRYSTALLINITY	0.0000		DEFAULT
POLDP	1	DEGREE OF POLYMERIZATION	1.0000		DEFAULT
POLPDI	1	POLYDISPERSITY INDEX	1.0000		DEFAULT
RHOM	1	MASS DENSITY	0.0000	KG/CUM	DEFAULT
RKTZRA	1	RACKETT PARAMETER	0.28924		PURE28
S025E	1	SUM OF ELEMENT ENTROPIES AT 25 C	0.20515E+06	J/KMOL-K	AQUEOUS
SG	1	STANDARD SPECIFIC GRAVITY AT 60 F	0.30000		PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
TB	1	NORMAL BOILING POINT	-182.96	C	PURE28
TC	1	CRITICAL TEMPERATURE	-118.57	C	PURE28
TCLKP	1	TC FOR LEE-KESLER-PLOCKER EOS	-118.57	C	DEFAULT
TCTRAP	1	TC FOR TRAPP MODEL	-118.57	C	DEFAULT
TREFHS	1	REFERENCE TEMPERATURE FOR SOLID REFERENCE STATE	25.000	C	DEFAULT
VB	1	LIQUID MOLAR VOLUME AT TB	0.28022E-01	CUM/KMOL	PURE28
VC	1	CRITICAL VOLUME	0.73400E-01	CUM/KMOL	PURE28
VCLKP	1	VC FOR LEE-KESLER-PLOCKER EOS	0.73400E-01	CUM/KMOL	DEFAULT
VCRKT	1	VC FOR RACKETT MODEL	0.73400E-01	CUM/KMOL	DEFAULT
VCTRAP	1	VC FOR TRAPP MODEL	0.73400E-01	CUM/KMOL	DEFAULT
VLCVT1	1	CHARACTERISTIC VOLUME FOR SCATCHARD-HILDEBRAND	0.28710E-02	CUM/KMOL	PURE28
VLSTD	1	API STANDARD LIQUID MOLAR VOLUME AT 60 F	0.53558E-01	CUM/KMOL	PURE28
ZC	1	CRITICAL COMPRESSIBILITY FACTOR	0.28800		PURE28
ZCTRAP	1	ZC FOR TRAPP MODEL	0.28800		DEFAULT
ZWITTER	1	ZWITTERIONS IDENTIFIER	0.0000		DEFAULT

TEMPERATURE DEPENDENT PARAMETERS

PROPERTY PARAMETERS (CONTINUED)

CPIGDP DIPPR ideal gas heat capacity

CPIGDP = A + B(C/T/SINH(C/T))^2 + D(E/T/COSH(E/T))^2

TEMP UNITS: K PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	29103.0		
B	=	10040.0		
C	=	2526.50		
D	=	9356.00		
E	=	1153.80		
T RANGE	=	50.00	TO	1500.00 K

CPLDIP DIPPR liquid heat capacity

CPLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	0.373359E+07		
B	=	77255.1		
C	=	608.703		
D	=	2.13142		
E	=	0.279630E-02		
T RANGE	=	-218.79	TO	-131.15 C

CPSDIP DIPPR solid heat capacity

CPSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	362874.		
B	=	1379.00		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-259.69	TO	-229.37 C

PROPERTY PARAMETERS (CONTINUED)

DHVLDP DIPPR heat of vaporization

DHVLDP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: J/KMOL

SET: 1 SOURCE: PURE28

A	=	0.900800E+07		
B	=	0.454200		
C	=	-0.409600		
D	=	0.318300		
E	=	0.00000		
T RANGE	=	-218.79	TO	-118.57 C

DNLDIP DIPPR liquid density

DNLDIP = A/(B^(1 + (1 - T/C)^D))

TEMP UNITS: K PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	3.91430		
B	=	0.287720		
C	=	154.580		
D	=	0.292400		
E	=	0.00000		
T RANGE	=	54.35	TO	154.58 K

DNSDIP DIPPR solid density

DNSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	44.5520		
B	=	0.00000		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-252.50	TO	-252.50 C

PROPERTY PARAMETERS (CONTINUED)

KLDIP DIPPR liquid thermal conductivity

KLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	-0.102847		
B	=	-0.138000E-02		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-213.15	TO	-123.15 C

KVDIP DIPPR vapor thermal conductivity

KVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.449940E-03		
B	=	0.745600		
C	=	56.6990		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	80.00	TO	2000.00 K

MULDIP DIPPR liquid viscosity

LN(MULDIP) = A + B/T + C LN(T) + DT^E

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	-4.14760		
B	=	94.0400		
C	=	-1.20700		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	54.36	TO	150.00 K

PROPERTY PARAMETERS (CONTINUED)

MUVDIP DIPPR vapor viscosity

MUVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	0.110100E-05		
B	=	0.563400		
C	=	96.3000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	54.35	TO	1500.00 K

PLXANT EXTENDED ANTOINE VAPOR PRESSURE

LN(PL) = A + B/(T + C) + DT + E LN(T) + FT^G

TEMP UNITS: K PROP UNITS: PA

SET: 1 SOURCE: PURE28

A	=	51.2450		
B	=	-1200.20		
C	=	0.00000		
D	=	0.00000		
E	=	-6.43610		
F	=	0.284050E-01		
G	=	1.00000		
T RANGE	=	54.36	TO	154.58 K

SIGDIP DIPPR liquid surface tension

SIGDIP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: N/M

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	0.380660E-01
B	=	1.21360
C	=	0.00000
D	=	0.00000
E	=	0.00000
T RANGE	=	-218.80 TO -118.57 C

VLBROC BRELVI-O-CONNELL
VOLUME PARAMETER

TEMP UNITS: C PROP UNITS: CUM/KMOL

SET: 1 SOURCE: AQUEOUS

A	=	0.733611E-01
B	=	0.00000

WATSOL WATER SOLUBILITY

LN(XWSOL) = A + B/T + CT

SET: 1 SOURCE: PURE28

A	=	-5.30000
B	=	-500.000
C	=	0.00000
T RANGE	=	200.00 TO 373.00

VECTOR PARAMETERS

ATOMNO ATOMIC NUMBER OF ALL ELEMENTS

SET: 1 SOURCE: PURE28

A	=	8.00000

NOATOM NUMBER OF OCCURENCES FOR
EACH TYPE OF ELEMENT

SET: 1 SOURCE: PURE28

A	=	2.00000

UFGRP UNIFAC GROUP COUNT

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3830.00	1.00000

UFGRPD DORTMUND-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3830.00	1.00000

UFGRPL LYNGBY-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3830.00	1.00000

PROPERTY PARAMETERS (CONTINUED)

PURE COMPONENT PARAMETERS

COMPONENT ID: ARGON
FORMULA: AR NAME: AR

SCALAR PARAMETERS

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
API	1	STANDARD API GRAVITY	340.00		PURE28
CHARGE	1	IONIC CHARGE	0.0000		AQUEOUS
CHI	1	STIEL POLAR FACTOR	0.0000		DEFAULT
CMPCLASS	1	COMPONET CLASS INDEX	100.00		DEFAULT
DELTA	1	SOLUBILITY PARAMETER AT 25 C	10906.	(J/CUM)**.5	PURE28
DGFORM	1	IDEAL GAS GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	PURE28
DGSFRM	1	SOLID GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHAQFM	1	AQUEOUS INFINITE DILUTION ENTHALPY OF FORMATION	-0.12100E+08	J/KMOL	AQUEOUS
DHFORM	1	IDEAL GAS ENTHALPY OF FORMATION	0.0000	J/KMOL	PURE28
DHSFRM	1	SOLID ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHVLB	1	ENTHALPY OF VAPORIZATION AT TB	0.64270E+07	J/KMOL	PURE28
DLWC	1	WILKE-CHANG DIFFUSING-COMPONENT FLAG	1.0000		DEFAULT
DVBLNC	1	CHAPMAN-ENSKOG-WILKE-LEE DIFFUSING COMPONENT FLAG	1.0000		DEFAULT
FREEZEPT	1		-189.37	C	PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
GMSHVL	1	SCATCHARD-HILDEBRAND LIQUID VOLUME AT 25 C	0.57064E-01	CUM/KMOL	DEFAULT
HCOM	1	STANDARD ENTHALPY OF COMBUSTION AT 25 C	0.0000	J/KMOL	PURE28
HCTYPE	1	HYDROCARBON COMPONET CLASS INDEX	0.0000		DEFAULT
LKPZC	1	ZC FOR LEE-KESLER-PLOCKER EOS	0.29050		DEFAULT
MUP	1	DIPOLE MOMENT	0.0000	(J*CUM)**.5	PURE28
MW	1	MOLECULAR WEIGHT	39.948		PURE28
OMEGA	1	PITZER ACENTRIC FACTOR	0.0000		PURE28
OMGLKP	1	OMEGA FOR LEE KESLER PLOCKER EOS	0.0000		DEFAULT
OMGRAP	1	OMEGA FOR TRAPP MODEL	0.0000		DEFAULT
PC	1	CRITICAL PRESSURE	0.48980E+07	PA	PURE28
PCLKP	1	PC FOR LEE-KESLER-PLOCKER EOS	0.48980E+07	PA	DEFAULT
PCTRAP	1	PC FOR TRAPP MODEL	0.48980E+07	PA	DEFAULT
POLCRY	1	POLYMER CRYSTALLINITY	0.0000		DEFAULT
POLDP	1	DEGREE OF POLYMERIZATION	1.0000		DEFAULT
POLPDI	1	POLYDISPERSITY INDEX	1.0000		DEFAULT
RHOM	1	MASS DENSITY	0.0000	KG/CUM	DEFAULT
RKTZRA	1	RACKETT PARAMETER	0.29310		PURE28
S025E	1	SUM OF ELEMENT ENTROPIES AT 25 C	0.15484E+06	J/KMOL-K	AQUEOUS
SG	1	STANDARD SPECIFIC GRAVITY AT 60 F	0.30000		PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
TB	1	NORMAL BOILING POINT	-185.87	C	PURE28
TC	1	CRITICAL TEMPERATURE	-122.29	C	PURE28
TCLKP	1	TC FOR LEE-KESLER-PLOCKER EOS	-122.29	C	DEFAULT
TCTRAP	1	TC FOR TRAPP MODEL	-122.29	C	DEFAULT
TREFHS	1	REFERENCE TEMPERATURE FOR SOLID REFERENCE STATE	25.000	C	DEFAULT
VB	1	LIQUID MOLAR VOLUME AT TB	0.28616E-01	CUM/KMOL	PURE28
VC	1	CRITICAL VOLUME	0.74590E-01	CUM/KMOL	PURE28
VCLKP	1	VC FOR LEE-KESLER-PLOCKER EOS	0.74590E-01	CUM/KMOL	DEFAULT
VCRKT	1	VC FOR RACKETT MODEL	0.74590E-01	CUM/KMOL	DEFAULT
VCTRAP	1	VC FOR TRAPP MODEL	0.74590E-01	CUM/KMOL	DEFAULT
VLCVT1	1	CHARACTERISTIC VOLUME FOR SCATCHARD-HILDEBRAND	0.49070E-02	CUM/KMOL	PURE28
VLSTD	1	API STANDARD LIQUID MOLAR VOLUME AT 60 F	0.53558E-01	CUM/KMOL	PURE28
ZC	1	CRITICAL COMPRESSIBILITY FACTOR	0.29100		PURE28
ZCTRAP	1	ZC FOR TRAPP MODEL	0.29100		DEFAULT
ZWITTER	1	ZWITTERIONS IDENTIFIER	0.0000		DEFAULT

TEMPERATURE DEPENDENT PARAMETERS

PROPERTY PARAMETERS (CONTINUED)

CPIGDP DIPPR ideal gas heat capacity

CPIGDP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	20786.0		
B	=	0.00000		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-173.15	TO	1226.85 C

CPLDIP DIPPR liquid heat capacity

CPLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	414914.		
B	=	4043.39		
C	=	11.0430		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-189.37	TO	-138.15 C

DHVLDP DIPPR heat of vaporization

DHVLDP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: J/KMOL

SET: 1 SOURCE: PURE28

A	=	0.842150E+07		
B	=	0.283330		
C	=	0.332810E-01		
D	=	0.305510E-01		
E	=	0.00000		
T RANGE	=	-189.37	TO	-122.29 C

PROPERTY PARAMETERS (CONTINUED)

DNLDIP DIPPR liquid density

DNLDIP = A/(B^(1 + (1 - T/C)^D))

TEMP UNITS: K PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	3.84690		
B	=	0.288100		
C	=	150.860		
D	=	0.297830		
E	=	0.00000		
T RANGE	=	83.78	TO	150.86 K

DNSDIP DIPPR solid density

DNSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	44.3330		
B	=	0.00000		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-273.15	TO	-273.15 C

KLDIP DIPPR liquid thermal conductivity

KLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	-0.211503		
B	=	-0.256289E-02		
C	=	-0.411000E-05		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-189.37	TO	-123.15 C

PROPERTY PARAMETERS (CONTINUED)

KVDIP DIPPR vapor thermal conductivity

KVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.633000E-03		
B	=	0.622100		
C	=	70.0000		
D	=	0.00000		
E	=	0.00000		
T RANGE =		90.00	TO	3273.10 K

MULDIP DIPPR liquid viscosity

LN(MULDIP) = A + B/T + C LN(T) + DT^E

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	-8.86850		
B	=	204.290		
C	=	-0.383050		
D	=	-0.129370E-21		
E	=	10.0000		
T RANGE =		83.78	TO	150.00 K

MUVDIP DIPPR vapor viscosity

MUVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	0.921210E-06		
B	=	0.605290		
C	=	83.2400		
D	=	0.00000		
E	=	0.00000		
T RANGE =		83.78	TO	3273.10 K

PROPERTY PARAMETERS (CONTINUED)

PLXANT EXTENDED ANTOINE VAPOR PRESSURE

LN(PL) = A + B/(T + C) + DT + E LN(T) + FT^G

TEMP UNITS: K PROP UNITS: PA

SET: 1 SOURCE: PURE28

A	=	42.1270		
B	=	-1093.10		
C	=	0.00000		
D	=	0.00000		
E	=	-4.14250		
F	=	0.572540E-04		
G	=	2.00000		
T RANGE	=	83.78	TO	150.86 K

SIGDIP DIPPR liquid surface tension

SIGDIP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: N/M

SET: 1 SOURCE: PURE28

A	=	0.382300E-01		
B	=	1.29270		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-189.37	TO	-122.29 C

VLBROC BRELVI-O-CONNELL
VOLUME PARAMETER

TEMP UNITS: C PROP UNITS: CUM/KMOL

SET: 1 SOURCE: AQUEOUS

A	=	0.748588E-01
B	=	0.00000

PROPERTY PARAMETERS (CONTINUED)

WATSOL WATER SOLUBILITY

LN(XWSOL) = A + B/T + CT

SET: 1 SOURCE: PURE28

A	=	-5.30000		
B	=	-500.000		
C	=	0.00000		
T RANGE	=	200.00	TO	373.00

VECTOR PARAMETERS

ATOMNO ATOMIC NUMBER OF ALL ELEMENTS

SET: 1 SOURCE: PURE28

A	=	18.0000

NOATOM NUMBER OF OCCURENCES FOR EACH TYPE OF ELEMENT

SET: 1 SOURCE: PURE28

A	=	1.00000

UFGRP UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3870.00	1.00000

UFGRPD DORTMUND-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3870.00	1.00000

UFGRPL LYNGBY-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

PROPERTY PARAMETERS (CONTINUED)

GROUP NUMBER	NUMBER OF OCCURENCES
3870.00	1.00000

PROPERTY PARAMETERS (CONTINUED)

PURE COMPONENT PARAMETERS

COMPONENT ID: CARBO-01
FORMULA: CO2 NAME: CO2

SCALAR PARAMETERS

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
API	1	STANDARD API GRAVITY	340.00		PURE28
CHARGE	1	IONIC CHARGE	0.0000		AQUEOUS
CHI	1	STIEL POLAR FACTOR	0.0000		DEFAULT
CMPCLASS	1	COMPONET CLASS INDEX	110.00		DEFAULT
DELTA	1	SOLUBILITY PARAMETER AT 25 C	10231.	(J/CUM)**.5	PURE28
DGFORM	1	IDEAL GAS GIBBS ENERGY OF FORMATION	-0.39437E+09	J/KMOL	PURE28
DGSFRM	1	SOLID GIBBS ENERGY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHAQFM	1	AQUEOUS INFINITE DILUTION ENTHALPY OF FORMATION	-0.41380E+09	J/KMOL	AQUEOUS
DHFORM	1	IDEAL GAS ENTHALPY OF FORMATION	-0.39351E+09	J/KMOL	PURE28
DHSFRM	1	SOLID ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHVLB	1	ENTHALPY OF VAPORIZATION AT TB	0.16370E+08	J/KMOL	PURE28
DLWC	1	WILKE-CHANG DIFFUSING-COMPONENT FLAG	1.0000		DEFAULT
DVBLNC	1	CHAPMAN-ENSKOG-WILKE-LEE DIFFUSING COMPONENT FLAG	1.0000		DEFAULT
FREEZEPT	1		-56.570	C	PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
GMSHVL	1	SCATCHARD-HILDEBRAND LIQUID VOLUME AT 25 C	0.41050E-01	CUM/KMOL	DEFAULT
HCOM	1	STANDARD ENTHALPY OF COMBUSTION AT 25 C	0.0000	J/KMOL	DEFAULT
HCTYPE	1	HYDROCARBON COMPONET CLASS INDEX	0.0000		DEFAULT
LKPZC	1	ZC FOR LEE-KESLER-PLOCKER EOS	0.27149		DEFAULT
MUP	1	DIPOLE MOMENT	0.0000	(J*CUM)**.5	PURE28
MW	1	MOLECULAR WEIGHT	44.010		PURE28
OMEGA	1	PITZER ACENTRIC FACTOR	0.22362		PURE28
OMGLKP	1	OMEGA FOR LEE KESLER PLOCKER EOS	0.22362		DEFAULT
OMGRAP	1	OMEGA FOR TRAPP MODEL	0.22362		DEFAULT
PC	1	CRITICAL PRESSURE	0.73830E+07	PA	PURE28
PCLKP	1	PC FOR LEE-KESLER-PLOCKER EOS	0.73830E+07	PA	DEFAULT
PCTRAP	1	PC FOR TRAPP MODEL	0.73830E+07	PA	DEFAULT
POLCRY	1	POLYMER CRYSTALLINITY	0.0000		DEFAULT
POLDP	1	DEGREE OF POLYMERIZATION	1.0000		DEFAULT
POLPDI	1	POLYDISPERSITY INDEX	1.0000		DEFAULT
RHOM	1	MASS DENSITY	0.0000	KG/CUM	DEFAULT
RKTZRA	1	RACKETT PARAMETER	0.27256		PURE28
S025E	1	SUM OF ELEMENT ENTROPIES AT 25 C	0.21089E+06	J/KMOL-K	AQUEOUS
SG	1	STANDARD SPECIFIC GRAVITY AT 60 F	0.30000		PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
TB	1	NORMAL BOILING POINT	-78.450	C	PURE28
TC	1	CRITICAL TEMPERATURE	31.060	C	PURE28
TCLKP	1	TC FOR LEE-KESLER-PLOCKER EOS	31.060	C	DEFAULT
TCTRAP	1	TC FOR TRAPP MODEL	31.060	C	DEFAULT
TREFHS	1	REFERENCE TEMPERATURE FOR SOLID REFERENCE STATE	25.000	C	DEFAULT
VB	1	LIQUID MOLAR VOLUME AT TB	0.35019E-01	CUM/KMOL	PURE28
VC	1	CRITICAL VOLUME	0.94000E-01	CUM/KMOL	PURE28
VCLKP	1	VC FOR LEE-KESLER-PLOCKER EOS	0.94000E-01	CUM/KMOL	DEFAULT
VCRKT	1	VC FOR RACKETT MODEL	0.94000E-01	CUM/KMOL	DEFAULT
VCTRAP	1	VC FOR TRAPP MODEL	0.94000E-01	CUM/KMOL	DEFAULT
VLCVT1	1	CHARACTERISTIC VOLUME FOR SCATCHARD-HILDEBRAND	0.47510E-02	CUM/KMOL	PURE28
VLSTD	1	API STANDARD LIQUID MOLAR VOLUME AT 60 F	0.53558E-01	CUM/KMOL	PURE28
ZC	1	CRITICAL COMPRESSIBILITY FACTOR	0.27400		PURE28
ZCTRAP	1	ZC FOR TRAPP MODEL	0.27400		DEFAULT
ZWITTER	1	ZWITTERIONS IDENTIFIER	0.0000		DEFAULT

TEMPERATURE DEPENDENT PARAMETERS

PROPERTY PARAMETERS (CONTINUED)

CPIGDP DIPPR ideal gas heat capacity

CPIGDP = A + B(C/T/SINH(C/T))^2 + D(E/T/COSH(E/T))^2

TEMP UNITS: K PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	29370.0		
B	=	34540.0		
C	=	1428.00		
D	=	26400.0		
E	=	588.000		
T RANGE	=	50.00	TO	5000.00 K

CPLDIP DIPPR liquid heat capacity

CPLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	111796.		
B	=	2057.87		
C	=	58.7661		
D	=	0.600520		
E	=	0.00000		
T RANGE	=	-53.15	TO	16.85 C

CPSDIP DIPPR solid heat capacity

CPSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	69223.9		
B	=	-9.26009		
C	=	-4.35054		
D	=	-0.325393E-01		
E	=	-0.769900E-04		
T RANGE	=	-248.15	TO	-56.57 C

PROPERTY PARAMETERS (CONTINUED)

DHVLDP DIPPR heat of vaporization

DHVLDP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: J/KMOL

SET: 1 SOURCE: PURE28

A	=	0.217300E+08		
B	=	0.382000		
C	=	-0.433900		
D	=	0.422130		
E	=	0.00000		
T RANGE	=	-56.57	TO	31.06 C

DNLDIP DIPPR liquid density

DNLDIP = A/(B^(1 + (1 - T/C)^D))

TEMP UNITS: K PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	2.76800		
B	=	0.262120		
C	=	304.210		
D	=	0.290800		
E	=	0.00000		
T RANGE	=	216.58	TO	304.21 K

DNSDIP DIPPR solid density

DNSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	30.3862		
B	=	-0.871116E-01		
C	=	-0.284700E-03		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-130.05	TO	-56.57 C

PROPERTY PARAMETERS (CONTINUED)

KLDIP DIPPR liquid thermal conductivity

KLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.108040		
B	=	-0.121750E-02		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-56.57	TO	26.85 C

KVDIP DIPPR vapor thermal conductivity

KVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	3.69000		
B	=	-0.383800		
C	=	964.000		
D	=	0.186000E+07		
E	=	0.00000		
T RANGE	=	194.67	TO	1500.00 K

MULDIP DIPPR liquid viscosity

LN(MULDIP) = A + B/T + C LN(T) + DT^E

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	18.7750		
B	=	-402.920		
C	=	-4.68540		
D	=	-0.691710E-25		
E	=	10.0000		
T RANGE	=	216.58	TO	303.15 K

PROPERTY PARAMETERS (CONTINUED)

MUVDIP DIPPR vapor viscosity

MUVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	0.214800E-05		
B	=	0.460000		
C	=	290.000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	194.67	TO	1500.00 K

PLXANT EXTENDED ANTOINE VAPOR PRESSURE

LN(PL) = A + B/(T + C) + DT + E LN(T) + FT^G

TEMP UNITS: K PROP UNITS: PA

SET: 1 SOURCE: PURE28

A	=	140.540		
B	=	-4735.00		
C	=	0.00000		
D	=	0.00000		
E	=	-21.2680		
F	=	0.409090E-01		
G	=	1.00000		
T RANGE	=	216.58	TO	304.21 K

SIGDIP DIPPR liquid surface tension

SIGDIP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: N/M

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	0.807100E-01
B	=	1.26620
C	=	0.00000
D	=	0.00000
E	=	0.00000
T RANGE	=	-56.57 TO 31.06 C

VLBROC BRELVI-O-CONNELL
VOLUME PARAMETER

TEMP UNITS: C PROP UNITS: CUM/KMOL

SET: 1 SOURCE: AQUEOUS

A	=	0.939446E-01
B	=	0.00000

WATSOL WATER SOLUBILITY

LN(XWSOL) = A + B/T + CT

SET: 1 SOURCE: PURE28

A	=	-5.30000
B	=	-500.000
C	=	0.00000
T RANGE	=	200.00 TO 373.00

VECTOR PARAMETERS

ATOMNO ATOMIC NUMBER OF ALL ELEMENTS

SET: 1 SOURCE: PURE28

A	=	6.00000
B	=	8.00000

NOATOM NUMBER OF OCCURENCES FOR
EACH TYPE OF ELEMENT

SET: 1 SOURCE: PURE28

A	=	1.00000
B	=	2.00000

PROPERTY PARAMETERS (CONTINUED)

UFGRP UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3850.00	1.00000

UFGRPD DORTMUND-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3850.00	1.00000

UFGRPL LYNGBY-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
3850.00	1.00000

PROPERTY PARAMETERS (CONTINUED)

PURE COMPONENT PARAMETERS

COMPONENT ID: WATER
FORMULA: H2O NAME: H2O

SCALAR PARAMETERS

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
API	1	STANDARD API GRAVITY	10.000		PURE28
CHARGE	1	IONIC CHARGE	0.0000		DEFAULT
CHI	1	STIEL POLAR FACTOR	0.0000		DEFAULT
CMPCLASS	1	COMPONET CLASS INDEX	100.00		DEFAULT
DELTA	1	SOLUBILITY PARAMETER AT 25 C	36831.	(J/CUM)**.5	PURE28
DGFORM	1	IDEAL GAS GIBBS ENERGY OF FORMATION	-0.22857E+09	J/KMOL	PURE28
DGSFRM	1	SOLID GIBBS ENERGY OF FORMATION	-0.23676E+09	J/KMOL	SOLIDS
DHAQFM	1	AQUEOUS INFINITE DILUTION ENTHALPY OF FORMATION	0.0000	J/KMOL	DEFAULT
DHFORM	1	IDEAL GAS ENTHALPY OF FORMATION	-0.24182E+09	J/KMOL	PURE28
DHSFRM	1	SOLID ENTHALPY OF FORMATION	-0.29292E+09	J/KMOL	SOLIDS
DHVLB	1	ENTHALPY OF VAPORIZATION AT TB	0.40694E+08	J/KMOL	PURE28
DLWC	1	WILKE-CHANG DIFFUSING-COMPONENT FLAG	1.0000		DEFAULT
DVBLNC	1	CHAPMAN-ENSKOG-WILKE-LEE DIFFUSING COMPONENT FLAG	1.0000		DEFAULT
FREEZEPT	1		-0.56843E-13	C	PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
GMSHVL	1	SCATCHARD-HILDEBRAND LIQUID VOLUME AT 25 C	0.70823E-01	CUM/KMOL	DEFAULT
HCOM	1	STANDARD ENTHALPY OF COMBUSTION AT 25 C	0.0000	J/KMOL	DEFAULT
HCTYPE	1	HYDROCARBON COMPONET CLASS INDEX	0.0000		DEFAULT
LKPZC	1	ZC FOR LEE-KESLER-PLOCKER EOS	0.26119		DEFAULT
MUP	1	DIPOLE MOMENT	0.58493E-24	(J*CUM)**.5	PURE28
MW	1	MOLECULAR WEIGHT	18.015		PURE28
OMEGA	1	PITZER ACENTRIC FACTOR	0.34486		PURE28
OMGLKP	1	OMEGA FOR LEE KESLER PLOCKER EOS	0.34486		DEFAULT
OMGRAP	1	OMEGA FOR TRAPP MODEL	0.34486		DEFAULT
PC	1	CRITICAL PRESSURE	0.22064E+08	PA	PURE28
PCLKP	1	PC FOR LEE-KESLER-PLOCKER EOS	0.22064E+08	PA	DEFAULT
PCTRAP	1	PC FOR TRAPP MODEL	0.22064E+08	PA	DEFAULT
POLCRY	1	POLYMER CRYSTALLINITY	0.0000		DEFAULT
POLDP	1	DEGREE OF POLYMERIZATION	1.0000		DEFAULT
POLPDI	1	POLYDISPERSITY INDEX	1.0000		DEFAULT
RHOM	1	MASS DENSITY	0.0000	KG/CUM	DEFAULT
RKTZRA	1	RACKETT PARAMETER	0.24317		PURE28
S025E	1	SUM OF ELEMENT ENTROPIES AT 25 C	0.0000	J/KMOL-K	DEFAULT
SG	1	STANDARD SPECIFIC GRAVITY AT 60 F	1.0000		PURE28

PROPERTY PARAMETERS (CONTINUED)

PARAM NAME	SET NO.	DESCRIPTIONS	VALUE	UNITS	SOURCE
TB	1	NORMAL BOILING POINT	100.00	C	PURE28
TC	1	CRITICAL TEMPERATURE	373.95	C	PURE28
TCLKP	1	TC FOR LEE-KESLER-PLOCKER EOS	373.95	C	DEFAULT
TCTRAP	1	TC FOR TRAPP MODEL	373.95	C	DEFAULT
TREFHS	1	REFERENCE TEMPERATURE FOR SOLID REFERENCE STATE	25.000	C	DEFAULT
VB	1	LIQUID MOLAR VOLUME AT TB	0.18831E-01	CUM/KMOL	PURE28
VC	1	CRITICAL VOLUME	0.55947E-01	CUM/KMOL	PURE28
VCLKP	1	VC FOR LEE-KESLER-PLOCKER EOS	0.55947E-01	CUM/KMOL	DEFAULT
VCRKT	1	VC FOR RACKETT MODEL	0.55947E-01	CUM/KMOL	DEFAULT
VCTRAP	1	VC FOR TRAPP MODEL	0.55947E-01	CUM/KMOL	DEFAULT
VLCVT1	1	CHARACTERISTIC VOLUME FOR SCATCHARD-HILDEBRAND	0.10000E-01	CUM/KMOL	PURE28
VLSTD	1	API STANDARD LIQUID MOLAR VOLUME AT 60 F	0.18050E-01	CUM/KMOL	PURE28
ZC	1	CRITICAL COMPRESSIBILITY FACTOR	0.22900		PURE28
ZCTRAP	1	ZC FOR TRAPP MODEL	0.22900		DEFAULT
ZWITTER	1	ZWITTERIONS IDENTIFIER	0.0000		DEFAULT

TEMPERATURE DEPENDENT PARAMETERS

PROPERTY PARAMETERS (CONTINUED)

CPIGDP DIPPR ideal gas heat capacity

CPIGDP = A + B(C/T/SINH(C/T))^2 + D(E/T/COSH(E/T))^2

TEMP UNITS: K PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	33363.0		
B	=	26790.0		
C	=	2610.50		
D	=	8896.00		
E	=	1169.00		
T RANGE	=	100.00	TO	2273.15 K

CPLDIP DIPPR liquid heat capacity

CPLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	76150.6		
B	=	-47.1863		
C	=	0.752315		
D	=	-0.387823E-02		
E	=	0.937010E-05		
T RANGE	=	0.01	TO	260.00 C

CPSDIP DIPPR solid heat capacity

CPSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: J/KMOL-K

SET: 1 SOURCE: PURE28

A	=	38120.5		
B	=	140.520		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-270.00	TO	0.00 C

PROPERTY PARAMETERS (CONTINUED)

DHVLDP DIPPR heat of vaporization

DHVLDP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: J/KMOL

SET: 1 SOURCE: PURE28

A	=	0.566000E+08		
B	=	0.612040		
C	=	-0.625700		
D	=	0.398800		
E	=	0.00000		
T RANGE	=	0.01	TO	373.95 C

DNLDIP DIPPR liquid density

DNLDIP = A + Bt^0.35 + Ct^(2/3) + Dt + Et^(4/3)

where t = 1 - T/Tc

TEMP UNITS: C PROP UNITS: KMOL/CUM

SET: 1 SOURCE: PURE28

A	=	17.8630		
B	=	58.6060		
C	=	-95.3960		
D	=	213.890		
E	=	-141.260		
T RANGE	=	0.01	TO	373.95 C

DNSDIP DIPPR solid density

DNSDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: KMOL/CUM

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	50.8883		
B	=	-0.784090E-02		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	-40.00	TO	0.00 C

KLDIP DIPPR liquid thermal conductivity

KLDIP = A + BT + CT^2 + DT^3 + ET^4

TEMP UNITS: C PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.567140		
B	=	0.172904E-02		
C	=	-0.655300E-05		
D	=	0.186100E-08		
E	=	0.00000		
T RANGE	=	0.01	TO	360.00 C

KVDIP DIPPR vapor thermal conductivity

KVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: WATT/M-K

SET: 1 SOURCE: PURE28

A	=	0.620410E-05		
B	=	1.39730		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	273.16	TO	1073.15 K

PROPERTY PARAMETERS (CONTINUED)

MULDIP DIPPR liquid viscosity

LN(MULDIP) = A + B/T + C LN(T) + DT^E

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	-52.8430		
B	=	3703.60		
C	=	5.86600		
D	=	-0.587900E-28		
E	=	10.0000		
T RANGE	=	273.16	TO	646.15 K

MUVDIP DIPPR vapor viscosity

MUVDIP = AT^B/(1 + C/T + D/T^2)

TEMP UNITS: K PROP UNITS: N-SEC/SQM

SET: 1 SOURCE: PURE28

A	=	0.170960E-07		
B	=	1.11460		
C	=	0.00000		
D	=	0.00000		
E	=	0.00000		
T RANGE	=	273.16	TO	1073.15 K

PLXANT EXTENDED ANTOINE VAPOR PRESSURE

LN(PL) = A + B/(T + C) + DT + E LN(T) + FT^G

TEMP UNITS: K PROP UNITS: PA

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: PURE28

A	=	73.6490		
B	=	-7258.20		
C	=	0.00000		
D	=	0.00000		
E	=	-7.30370		
F	=	0.416530E-05		
G	=	2.00000		
T RANGE	=	273.16	TO 647.10	K

SIGDIP DIPPR liquid surface tension

SIGDIP = A(1 - Tr)^(B + CTr+ DTr^2 + ETr^3) where Tr = T/Tc

TEMP UNITS: C PROP UNITS: N/M

SET: 1 SOURCE: PURE28

A	=	0.177660		
B	=	2.56700		
C	=	-3.33770		
D	=	1.96990		
E	=	0.00000		
T RANGE	=	0.01	TO 373.95	C

VLBROC BRELVI-O-CONNELL
VOLUME PARAMETER

TEMP UNITS: C PROP UNITS: CUM/KMOL

SET: 1 SOURCE: DEFAULT

A	=	0.559472E-01
B	=	0.00000

WATSOL WATER SOLUBILITY

LN(XWSOL) = A + B/T + CT

PROPERTY PARAMETERS (CONTINUED)

SET: 1 SOURCE: DEFAULT

A	=	1.76832		
B	=	-2282.98		
C	=	0.00000		
T RANGE	=	0.00	TO	924.91

VECTOR PARAMETERS

ATOMNO ATOMIC NUMBER OF ALL ELEMENTS

SET: 1 SOURCE: PURE28

A	=	1.00000
B	=	8.00000

NOATOM NUMBER OF OCCURENCES FOR EACH TYPE OF ELEMENT

SET: 1 SOURCE: PURE28

A	=	2.00000
B	=	1.00000

UFGRP UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
1300.00	1.00000

UFGRPD DORTMUND-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
1300.00	1.00000

UFGRPL LYNGBY-UNIFAC GROUP COUNT

SET: 1 SOURCE: PURE28

GROUP NUMBER	NUMBER OF OCCURENCES
1300.00	1.00000

PROPERTY PARAMETERS (CONTINUED)

BINARY PARAMETERS

HENRY HENRY-S CONSTANTS

LN(HIJ) = AIJ + BIJ/T + CIJ LN(T) + DIJ T + EIJ / T^2

THIS PARAMETER IS UNSYMMETRIC, BUT ONLY VALUE I-J ALLOWED

UNITS: PA

SET: 1

COMP I	COMP J	VALUE I-J				
NITRO-01	WATER	Aij	=	176.507		
		Bij	=	-8432.77		
		Cij	=	-21.5580		
		Dij	=	-0.843624E-02		
		Gij	=	0.00000		
		T RANGE	=	273.00	TO	346.00 K
		SOURCE	=	INPUT		
OXYGE-01	WATER	Aij	=	155.921		
		Bij	=	-7775.06		
		Cij	=	-18.3974		
		Dij	=	-0.944354E-02		
		Gij	=	0.00000		
		T RANGE	=	274.00	TO	348.00 K
		SOURCE	=	INPUT		
ARGON	WATER	Aij	=	180.991		
		Bij	=	-8137.13		
		Cij	=	-23.2547		
		Dij	=	0.306357E-02		
		Gij	=	0.00000		
		T RANGE	=	274.00	TO	347.00 K
		SOURCE	=	INPUT		

PROPERTY PARAMETERS (CONTINUED)

CARBO-01 WATER	Aij	=	171.378
	Bij	=	-8741.55
	Cij	=	-21.6690
	Dij	=	0.110259E-02
	Gij	=	0.00000
	T RANGE	=	273.00 TO 353.00 K
	SOURCE	=	INPUT

LKPKIJ LEE-KESLER-PLOCKER EOS KIJ

THIS PARAMETER IS SYMMETRIC. VALUE I-J = VALUE J-I

SET: 1

COMP I	COMP J		VALUE I-J
NITRO-01	OXYGE-01	Aij	= -0.890000E-02
		SOURCE	= INPUT
NITRO-01	ARGON	Aij	= -0.152000E-01
		SOURCE	= INPUT
NITRO-01	CARBO-01	Aij	= 0.107400
		SOURCE	= INPUT
OXYGE-01	ARGON	Aij	= -0.144000E-01
		SOURCE	= INPUT
CARBO-01	WATER	Aij	= -0.633000E-01
		SOURCE	= INPUT

EXPT 280 - TRIAL 1A (++)
U-O-S BLOCK SECTION

BLOCK: B1 MODEL: RADFRAC

INLETS -	1	STAGE	2
	2	STAGE	1
OUTLETS -	3	STAGE	1
	4	STAGE	2

PROPERTY OPTION SET: IDEAL IDEAL LIQUID / IDEAL GAS
HENRY-COMPS ID: HC-1

*** MASS AND ENERGY BALANCE ***

	IN	OUT	RELATIVE DIFF.
TOTAL BALANCE			
MOLE(MOL/MIN)	58.5084	58.5084	0.121443E-15
MASS(KG/MIN)	1.08690	1.08690	0.163513E-10
ENTHALPY(WATT)	-263410.	-263410.	-0.114225E-09

*** CO2 EQUIVALENT SUMMARY ***

FEED STREAMS CO2E	0.528118E-04	KG/MIN
PRODUCT STREAMS CO2E	0.528118E-04	KG/MIN
NET STREAMS CO2E PRODUCTION	-0.278253E-13	KG/MIN
UTILITIES CO2E PRODUCTION	0.00000	KG/MIN
TOTAL CO2E PRODUCTION	-0.278253E-13	KG/MIN

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

****
**** INPUT DATA ****
****

**** INPUT PARAMETERS ****

CALCULATION MODE	RIGOROUS RATE-BASED
NUMBER OF STAGES	2
TOTAL NUMBER OF RATE-BASED STAGES	2
TOTAL NUMBER OF EQUILIBRIUM STAGES	0
MAXIMUM NUMBER OF FLASH ITERATIONS	30
FLASH TOLERANCE	0.000100000
HYDRAULIC PARAMETER CALCULATIONS	NO
DESIGN SPECIFICATION METHOD	NESTED

EQUILIBRIUM (INITIALIZATION) PARAMETERS

ALGORITHM OPTION	STANDARD
ABSORBER OPTION	NO
INITIALIZATION OPTION	STANDARD
INSIDE LOOP CONVERGENCE METHOD	BROYDEN
MAXIMUM NO. OF OUTSIDE LOOP ITERATIONS	25
MAXIMUM NO. OF INSIDE LOOP ITERATIONS	10
OUTSIDE LOOP CONVERGENCE TOLERANCE	0.000100000

RATE-BASED PARAMETERS

RATESEP CONVERGENCE TOLERANCE	0.100000-04
MAXIMUM NUMBER OF RATESEP ITERATIONS	25
CHILTON-COLBURN AVERAGING PARAMETER	0.000100000

**** COL-SPECS ****

MOLAR VAPOR DIST / TOTAL DIST		1.00000
CONDENSER DUTY (W/O SUBCOOL)	WATT	0.0
REBOILER DUTY	WATT	0.0

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** PROFILES ****

P-SPEC STAGE 1 PRES, PA 101,000.

****
**** RESULTS ****
****

*** COMPONENT SPLIT FRACTIONS ***

	OUTLET STREAMS	
	3	4
COMPONENT:		
NITRO-01	.99983	.16617E-03
OXYGE-01	.99968	.31844E-03
ARGON	.99965	.34632E-03
CARBO-01	.99262	.73760E-02
WATER	.38518E-02	.99615

*** SUMMARY OF KEY RESULTS ***

TOP STAGE LIQ. TEMPERATURE	C	38.9885
TOP STAGE VAP. TEMPERATURE	C	38.2230
BOTTOM STAGE LIQ. TEMPERATURE	C	37.0128
BOTTOM STAGE VAP. TEMPERATURE	C	34.5392
TOP STAGE LIQUID FLOW	MOL/MIN	55.4598
BOTTOM STAGE LIQUID FLOW	MOL/MIN	55.2952
TOP STAGE VAPOR FLOW	MOL/MIN	3.21320
BOILUP VAPOR FLOW	MOL/MIN	3.16452
CONDENSER DUTY (W/O SUBCOOL)	WATT	0.0
REBOILER DUTY	WATT	0.0

EXPT 280 - TRIAL 1A (++)
U-O-S BLOCK SECTION

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** PROFILES ****

NOTE REPORTED VALUES FOR STAGE LIQUID AND VAPOR RATES ARE THE FLOWS FROM THE STAGE INCLUDING ANY SIDE PRODUCT.

STAGE	TEMPERATURE C		PRESSURE PA	ENTHALPY J/KMOL	HEAT DUTY WATT
	LIQUID	VAPOR	LIQUID	VAPOR	
1	38.988	38.223	0.10100E+06	-0.28475E+09	-0.15848E+08
2	37.013	34.539	0.10225E+06	-0.28490E+09	-0.12451E+08

STAGE	FLOW RATE MOL/MIN		FEED RATE MOL/MIN			PRODUCT RATE MOL/MIN	
	LIQUID	VAPOR	LIQUID	VAPOR	MIXED	LIQUID	VAPOR
1	55.46	3.213	55.5084				3.2132
2	55.30	3.165			3.0000	55.2952	

**** MASS FLOW PROFILES ****

STAGE	FLOW RATE KG/MIN		FEED RATE KG/MIN			PRODUCT RATE KG/MIN	
	LIQUID	VAPOR	LIQUID	VAPOR	MIXED	LIQUID	VAPOR
1	0.9991	0.9073E-01	1.0000				.90731-01
2	0.9962	0.8986E-01			.86897-01	0.9961	

**** MOLE-X-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.55371E-05	0.28604E-05	0.13785E-06	0.12287E-06	0.99999
2	0.70392E-05	0.36195E-05	0.17474E-06	0.16007E-06	0.99999

**** MOLE-Y-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.72887	0.19554	0.86799E-02	0.37071E-03	0.66540E-01
2	0.74018	0.19860	0.88159E-02	0.37856E-03	0.52030E-01

**** K-VALUES ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.10045E+06	52934.	48685.	2296.0	0.69235E-01
2	97373.	51072.	46913.	2171.2	0.61361E-01

**** MASS-X-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.86100E-05	0.50805E-05	0.30567E-06	0.30016E-06	0.99999
2	0.10946E-04	0.64289E-05	0.38748E-06	0.39104E-06	0.99998

EXPT 280 - TRIAL 1A (++)
U-O-S BLOCK SECTION

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** MASS-Y-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.72310	0.22159	0.12280E-01	0.57778E-03	0.42452E-01
2	0.73021	0.22379	0.12402E-01	0.58672E-03	0.33009E-01

**** INTERFACE MOLE X-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.72353E-05	0.36833E-05	0.17776E-06	0.16067E-06	0.99999
2	0.75266E-05	0.38505E-05	0.18604E-06	0.17218E-06	0.99999

**** INTERFACE MOLE Y-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.72677	0.19497	0.86543E-02	0.36889E-03	0.69234E-01
2	0.73289	0.19665	0.87276E-02	0.37382E-03	0.61360E-01

**** INTERFACE MASS X-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.11251E-04	0.65423E-05	0.39417E-06	0.39250E-06	0.99998
2	0.11704E-04	0.68392E-05	0.41253E-06	0.42061E-06	0.99998

**** INTERFACE MASS Y-PROFILE ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.72177	0.22118	0.12256E-01	0.57555E-03	0.44218E-01
2	0.72563	0.22240	0.12322E-01	0.58147E-03	0.39069E-01

**** INTERFACE TEMPERATURE, AREA, DENSITIES ****

STAGE	TEMPERATURE C	AREA SQM	LIQUID DENSITY KMOL/CUM	VAPOR DENSITY KMOL/CUM
1	38.976	0.58018	54.418	0.39013E-01
2	36.971	0.57551	54.525	0.39967E-01

**** LIQUID MASS TRANSFER RATES, MOL/MIN ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.30709E-03	0.15863E-03	0.76450E-05	0.68144E-05	-0.49155E-01
2	0.82152E-04	0.41504E-04	0.20173E-05	0.20368E-05	-0.16465

**** INTERFACE MASS TRANSFER RATES, MOL/MIN ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.30709E-03	0.15863E-03	0.76450E-05	0.68144E-05	-0.49155E-01
2	0.82152E-04	0.41504E-04	0.20173E-05	0.20368E-05	-0.16465

**** VAPOR MASS TRANSFER RATES, MOL/MIN ****

STAGE	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
1	0.30709E-03	0.15863E-03	0.76450E-05	0.68144E-05	-0.49155E-01
2	0.82152E-04	0.41504E-04	0.20173E-05	0.20368E-05	-0.16465

EXPT 280 - TRIAL 1A (++)
U-O-S BLOCK SECTION

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** HEAT TRANSFER RATES, WATT ****

STAGE	TOTAL	CONDUCTION		CONVECTION	
		LIQUID	VAPOR	LIQUID	VAPOR
1	192.0	-41.18	-5.692	233.2	197.7
2	644.6	-137.2	-18.03	781.8	662.6

**** HEAT TRANSFER COEFFICIENTS, WATT/SQM-K ****

STAGE	LIQUID	VAPOR
1	5893.1	13.022
2	5755.9	12.882

**** PACKING HETP, METER ****

STAGE	
1	0.62797
2	0.63266

**** STAGE 1 BINARY DIFFUSIVITIES & MASS TRANSFER COEFFICIENTS ****

**** LIQUID BINARY DIFFUSIVITIES, SQM/SEC ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.23687E-08	0.23920E-08	0.21266E-08	0.25661E-08
OXYGE-01	0.23687E-08	0.0000	0.25672E-08	0.22889E-08	0.29158E-08
ARGON	0.23920E-08	0.25672E-08	0.0000	0.27369E-08	0.28794E-08
CARBO-01	0.21266E-08	0.22889E-08	0.27369E-08	0.0000	0.25508E-08
WATER	0.25661E-08	0.29158E-08	0.28794E-08	0.25508E-08	0.0000

**** VAPOR BINARY DIFFUSIVITIES, SQM/SEC ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.23918E-04	0.22888E-04	0.18305E-04	0.26272E-04
OXYGE-01	0.23918E-04	0.0000	0.22884E-04	0.18082E-04	0.26547E-04
ARGON	0.22888E-04	0.22884E-04	0.0000	0.17119E-04	0.25674E-04
CARBO-01	0.18305E-04	0.18082E-04	0.17119E-04	0.0000	0.19254E-04
WATER	0.26272E-04	0.26547E-04	0.25674E-04	0.19254E-04	0.0000

**** LIQUID BINARY MASS TRANSFER COEFFICIENTS, MOL/MIN ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	173.91	174.76	164.78	181.01
OXYGE-01	173.91	0.0000	181.05	170.95	192.95
ARGON	174.76	181.05	0.0000	186.94	191.74
CARBO-01	164.78	170.95	186.94	0.0000	180.47
WATER	181.01	192.95	191.74	180.47	0.0000

**** VAPOR BINARY MASS TRANSFER COEFFICIENTS, MOL/MIN ****

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	15.965	15.503	13.357	16.996
OXYGE-01	15.965	0.0000	15.501	13.249	17.114
ARGON	15.503	15.501	0.0000	12.774	16.737
CARBO-01	13.357	13.249	12.774	0.0000	13.815
WATER	16.996	17.114	16.737	13.815	0.0000

**** STAGE 2 BINARY DIFFUSIVITIES & MASS TRANSFER COEFFICIENTS ****

**** LIQUID BINARY DIFFUSIVITIES, SQM/SEC ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.22653E-08	0.22875E-08	0.20338E-08	0.24539E-08
OXYGE-01	0.22653E-08	0.0000	0.24550E-08	0.21895E-08	0.27883E-08
ARGON	0.22875E-08	0.24550E-08	0.0000	0.26203E-08	0.27535E-08
CARBO-01	0.20338E-08	0.21895E-08	0.26203E-08	0.0000	0.24393E-08
WATER	0.24539E-08	0.27883E-08	0.27535E-08	0.24393E-08	0.0000

**** VAPOR BINARY DIFFUSIVITIES, SQM/SEC ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.23131E-04	0.22135E-04	0.17687E-04	0.25347E-04
OXYGE-01	0.23131E-04	0.0000	0.22127E-04	0.17467E-04	0.25609E-04
ARGON	0.22135E-04	0.22127E-04	0.0000	0.16537E-04	0.24767E-04
CARBO-01	0.17687E-04	0.17467E-04	0.16537E-04	0.0000	0.18565E-04
WATER	0.25347E-04	0.25609E-04	0.24767E-04	0.18565E-04	0.0000

**** LIQUID BINARY MASS TRANSFER COEFFICIENTS, MOL/MIN ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	164.33	165.13	155.71	171.03
OXYGE-01	164.33	0.0000	171.07	161.56	182.32
ARGON	165.13	171.07	0.0000	176.74	181.17
CARBO-01	155.71	161.56	176.74	0.0000	170.52
WATER	171.03	182.32	181.17	170.52	0.0000

**** VAPOR BINARY MASS TRANSFER COEFFICIENTS, MOL/MIN ****

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	15.644	15.191	13.081	16.627
OXYGE-01	15.644	0.0000	15.188	12.972	16.741
ARGON	15.191	15.188	0.0000	12.508	16.373
CARBO-01	13.081	12.972	12.508	0.0000	13.510
WATER	16.627	16.741	16.373	13.510	0.0000

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** STAGE 1 DIMENSIONLESS NUMBERS IN CORRELATIONS ****
LIQUID REYNOLDS NUMBER FOR PACKING = RHOL*UL/(AP*MUL)
LIQUID REYNOLDS NUMBER FOR TRAYS = RHOL*D*UL/MUL/NP
VAPOR REYNOLDS NUMBER FOR PACKING = RHOV*UV/(AP*MUV)
VAPOR REYNOLDS NUMBER FOR TRAYS = RHOV*D*UV/MUV
LIQUID FROUDE NUMBER FOR PACKING = AP*UL*UL/G
LIQUID FROUDE NUMBER FOR TRAYS = UL*UL/(G*D)
LIQUID WEBBER NUMBER FOR PACKING = RHOL*UL*UL/(AP*SIGMA)
LIQUID WEBBER NUMBER FOR TRAYS = RHOL*D*UL*UL/SIGMA
LIQUID CAPILARY NUMBER FOR PACKING AND TRAYS = UL*MUL/SIGMA
LIQUID REYNOLDS NUMBER FOR PACKING AND TRAYS = MUL/(RHOL*DL)
VAPOR REYNOLDS NUMBER FOR PACKING AND TRAYS = MUV/(RHOV*DV)
LIQUID SHERWOOD NUMBER FOR PACKING = KL/(AP*DL)
LIQUID SHERWOOD NUMBER FOR TRAYS = KL*D/DL
VAPOR SHERWOOD NUMBER FOR PACKING = KV/(AP*DV)
VAPOR SHERWOOD NUMBER FOR TRAYS = KV*D/DV
WHERE:
RHOL IS THE LIQUID MASS DENSITY
RHOV IS THE VAPOR MASS DENSITY
MUL IS THE LIQUID VISCOSITY
MUV IS THE VAPOR VISCOSITY
DL IS THE LIQUID DIFFUSIVITY
DV IS THE VAPOR DIFFUSIVITY
SIGMA IS THE LIQUID SURFACE TENSION
UL IS THE LIQUID VELOCITY
UV IS THE VAPOR VELOCITY
AP IS THE SPECIFIC AREA OF THE PACKING
D IS THE CHARACTERISTIC LENGTH
G IS THE GRAVITATIONAL CONSTANT
NP IS THE NUMBER OF PASSES FOR A TRAY

LIQUID REYNOLDS NUMBER = 10.258

VAPOR REYNOLDS NUMBER = 33.870

LIQUID FROUDE NUMBER = 0.54942E-03

LIQUID WEBBER NUMBER = 0.33904E-03

LIQUID CAPILARY NUMBER = 0.33051E-04

LIQUID SCHMIDT NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	294.64	291.77	328.19	271.98
OXYGE-01	294.64	0.0000	271.86	304.92	239.36
ARGON	291.77	271.86	0.0000	255.00	242.38
CARBO-01	328.19	304.92	255.00	0.0000	273.60
WATER	271.98	239.36	242.38	273.60	0.0000

VAPOR SCHMIDT NUMBER :

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.71419	0.74635	0.93321	0.65021
OXYGE-01	0.71419	0.0000	0.74646	0.94471	0.64347
ARGON	0.74635	0.74646	0.0000	0.99786	0.66535
CARBO-01	0.93321	0.94471	0.99786	0.0000	0.88721
WATER	0.65021	0.64347	0.66535	0.88721	0.0000

LIQUID SHERWOOD NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	82.113	81.711	86.662	78.891
OXYGE-01	82.113	0.0000	78.874	83.533	74.009
ARGON	81.711	78.874	0.0000	76.390	74.476
CARBO-01	86.662	83.533	76.390	0.0000	79.127
WATER	78.891	74.009	74.476	79.127	0.0000

VAPOR SHERWOOD NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	1.0413	1.0567	1.1384	1.0092
OXYGE-01	1.0413	0.0000	1.0567	1.1430	1.0057
ARGON	1.0567	1.0567	0.0000	1.1641	1.0170
CARBO-01	1.1384	1.1430	1.1641	0.0000	1.1193
WATER	1.0092	1.0057	1.0170	1.1193	0.0000

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

**** STAGE 2 DIMENSIONLESS NUMBERS IN CORRELATIONS ****
LIQUID REYNOLDS NUMBER FOR PACKING = RHOL*UL/(AP*MUL)
LIQUID REYNOLDS NUMBER FOR TRAYS = RHOL*D*UL/MUL/NP
VAPOR REYNOLDS NUMBER FOR PACKING = RHOV*UV/(AP*MUV)
VAPOR REYNOLDS NUMBER FOR TRAYS = RHOV*D*UV/MUV
LIQUID FROUDE NUMBER FOR PACKING = AP*UL*UL/G
LIQUID FROUDE NUMBER FOR TRAYS = UL*UL/(G*D)
LIQUID WEBBER NUMBER FOR PACKING = RHOL*UL*UL/(AP*SIGMA)
LIQUID WEBBER NUMBER FOR TRAYS = RHOL*D*UL*UL/SIGMA
LIQUID CAPILARY NUMBER FOR PACKING AND TRAYS = UL*MUL/SIGMA
LIQUID REYNOLDS NUMBER FOR PACKING AND TRAYS = MUL/(RHOL*DL)
VAPOR REYNOLDS NUMBER FOR PACKING AND TRAYS = MUV/(RHOV*DV)
LIQUID SHERWOOD NUMBER FOR PACKING = KL/(AP*DL)
LIQUID SHERWOOD NUMBER FOR TRAYS = KL*D/DL
VAPOR SHERWOOD NUMBER FOR PACKING = KV/(AP*DV)
VAPOR SHERWOOD NUMBER FOR TRAYS = KV*D/DV
WHERE:
RHOL IS THE LIQUID MASS DENSITY
RHOV IS THE VAPOR MASS DENSITY
MUL IS THE LIQUID VISCOSITY
MUV IS THE VAPOR VISCOSITY
DL IS THE LIQUID DIFFUSIVITY
DV IS THE VAPOR DIFFUSIVITY
SIGMA IS THE LIQUID SURFACE TENSION
UL IS THE LIQUID VELOCITY
UV IS THE VAPOR VELOCITY
AP IS THE SPECIFIC AREA OF THE PACKING
D IS THE CHARACTERISTIC LENGTH
G IS THE GRAVITATIONAL CONSTANT
NP IS THE NUMBER OF PASSES FOR A TRAY

LIQUID REYNOLDS NUMBER = 9.8429

VAPOR REYNOLDS NUMBER = 33.782

LIQUID FROUDE NUMBER = 0.54402E-03

LIQUID WEBBER NUMBER = 0.33454E-03

LIQUID CAPILARY NUMBER = 0.33988E-04

LIQUID SCHMIDT NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	319.51	316.41	355.87	294.95
OXYGE-01	319.51	0.0000	294.82	330.56	259.57
ARGON	316.41	294.82	0.0000	276.22	262.86
CARBO-01	355.87	330.56	276.22	0.0000	296.71
WATER	294.95	259.57	262.86	296.71	0.0000

VAPOR SCHMIDT NUMBER :

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	0.71178	0.74381	0.93088	0.64957
OXYGE-01	0.71178	0.0000	0.74408	0.94259	0.64293
ARGON	0.74381	0.74408	0.0000	0.99559	0.66478
CARBO-01	0.93088	0.94259	0.99559	0.0000	0.88687
WATER	0.64957	0.64293	0.66478	0.88687	0.0000

LIQUID SHERWOOD NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	81.630	81.233	86.149	78.429
OXYGE-01	81.630	0.0000	78.412	83.030	73.576
ARGON	81.233	78.412	0.0000	75.898	74.040
CARBO-01	86.149	83.030	75.898	0.0000	78.664
WATER	78.429	73.576	74.040	78.664	0.0000

VAPOR SHERWOOD NUMBER :

	NITRO-01	OXYGE-01	ARGON	CARBO-01	WATER
NITRO-01	0.0000	1.0382	1.0535	1.1354	1.0070
OXYGE-01	1.0382	0.0000	1.0537	1.1401	1.0036
ARGON	1.0535	1.0537	0.0000	1.1611	1.0148
CARBO-01	1.1354	1.1401	1.1611	0.0000	1.1172
WATER	1.0070	1.0036	1.0148	1.1172	0.0000

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

****
***** HYDRAULIC PARAMETERS *****
****

*** DEFINITIONS ***

MARANGONI INDEX = SIGMA - SIGMATO
FLOW PARAM = (ML/MV)*SQRT(RHOV/RHOL)
QR = QV*SQRT(RHOV/(RHOL-RHOV))
F FACTOR = QV*SQRT(RHOV)
WHERE:
SIGMA IS THE SURFACE TENSION OF LIQUID FROM THE STAGE
SIGMATO IS THE SURFACE TENSION OF LIQUID TO THE STAGE
ML IS THE MASS FLOW OF LIQUID FROM THE STAGE
MV IS THE MASS FLOW OF VAPOR TO THE STAGE
RHOL IS THE MASS DENSITY OF LIQUID FROM THE STAGE
RHOV IS THE MASS DENSITY OF VAPOR TO THE STAGE
QV IS THE VOLUMETRIC FLOW RATE OF VAPOR TO THE STAGE

	TEMPERATURE C	
STAGE	LIQUID FROM	VAPOR TO
1	38.988	34.539
2	37.013	22.070

	MASS FLOW KG/MIN		VOLUME FLOW CUM/SEC		MOLECULAR WEIGHT	
STAGE	LIQUID FROM	VAPOR TO	LIQUID FROM	VAPOR TO	LIQUID FROM	VAPOR TO
1	0.99913	0.89860E-01	0.16986E-04	0.13196E-02	18.015	28.396
2	0.99617	0.86897E-01	0.16902E-04	0.12003E-02	18.015	28.966

	DENSITY KG/CUM		VISCOSITY N-SEC/SQM		SURFACE TENSION N/M
STAGE	LIQUID FROM	VAPOR TO	LIQUID FROM	VAPOR TO	LIQUID FROM
1	980.36	1.1349	0.68421E-03	0.18686E-04	0.69956E-01
2	982.29	1.2066	0.71096E-03	0.18220E-04	0.70338E-01

	MARANGONI INDEX	FLOW PARAM	QR	REDUCED F-FACTOR
STAGE	N/M		CUM/SEC	(KG-CUM)**.5/SEC
1		0.36914	0.44925E-04	0.14058E-02
2	0.38200E-03	0.37681	0.42094E-04	0.13185E-02

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

****
***** PACKING RATING CALCULATIONS *****
****

****
*** SECTION 1 ***
****

STARTING STAGE NUMBER		1
ENDING STAGE NUMBER		2
CAPACITY CALCULATION METHOD		ECKERT
PRESSURE DROP CALCULATION METHOD		ECKERT
LIQUID HOLDUP CALCULATION METHOD		STICHL
PRESSURE PROFILE UPDATED		NO

DESIGN PARAMETERS

OVERDESIGN FACTOR		1.00000
SYSTEM FOAMING FACTOR		1.00000
COLUMN DIAMETER	METER	0.080000
MAXIMUM CAPACITY FACTOR	M/SEC	MISSING

PACKING SPECIFICATIONS

PACKING TYPE		RASCHIG-RING
PACKING MATERIAL		CERAMIC
PACKING SIZE		0.375-IN
VENDOR		GENERIC
PACKING FACTOR	1/M	1,400.00
PACKING SURFACE AREA	SQM/CUM	472.000
PACKING VOID FRACTION		0.65500
FIRST STICHLMAIR CONSTANT		0.19326
SECOND STICHLMAIR CONSTANT		0.93295
THIRD STICHLMAIR CONSTANT		7.69925
PACKING HEIGHT PER STAGE	METER	0.63500
PACKING HEIGHT	METER	1.27000

EXPT 280 - TRIAL 1A (++)
U-O-S BLOCK SECTION

BLOCK: B1 MODEL: RADFRAC (CONTINUED)

RATE-BASED SPECIFICATIONS

FLOW MODEL	MIXED-MIXED
INTERFACIAL AREA FACTOR	1.00000
LIQUID FILM RESISTANCE	FILMRXN
VAPOR FILM RESISTANCE	FILMRXN
LIQUID FILM CORRECTION	NO
VAPOR FILM CORRECTION	NO
MASS TRANSFER CORRELATION	ONDA-68
HEAT TRANSFER CORRELATION	CHILTON-COLB
INTERFACIAL AREA CORRELATION	ONDA-68

***** RATING RESULTS *****

COLUMN DIAMETER	METER	0.080000
MAXIMUM FRACTIONAL CAPACITY		0.45573
MAXIMUM CAPACITY FACTOR	M/SEC	0.0089376
PRESSURE DROP FOR THE SECTION	PA	166.427
AVERAGE PRESSURE DROP/HEIGHT	N/CUM	131.045
MAXIMUM LIQUID HOLDUP/STAGE	CUM	0.00030645
MAX LIQ SUPERFICIAL VELOCITY	M/SEC	0.0033792

**** RATING PROFILES ****

STAGE	HEIGHT FROM TOP OF SECTION METER	FRACTIONAL CAPACITY	PRESSURE DROP PA	PRESSURE DROP/HEIGHT N/CUM	LIQUID HOLDUP CUM	HETP METER
1	0.000	0.4557	85.313	134.35	0.3065E-03	0.6280
2	0.6350	0.4496	81.114	127.74	0.3022E-03	0.6327

STAGE	LIQUID SUPERFICIAL VELOCITY M/SEC
1	0.3379E-02
2	0.3363E-02

STREAM NAMES

ID	LONG-NAME
2	Liquid inlet
1	Gas inlet
3	Gas outlet
4	Liquid outlet

EXPT 280 - TRIAL 1A (++)

STREAM SECTION

1 2 3 4

STREAM ID	1 Gas inlet	2 Liquid inlet	3 Gas outlet	4 Liquid outlet
FROM :	----	----	B1	B1
TO :	B1	B1	----	----
SUBSTREAM: MIXED				
PHASE:	VAPOR	LIQUID	VAPOR	LIQUID
COMPONENTS: MOL/MIN				
NITRO-01	2.3424	0.0	2.3420	3.8924-04
OXYGE-01	0.6285	0.0	0.6283	2.0014-04
ARGON	2.7900-02	0.0	2.7890-02	9.6623-06
CARBO-01	1.2000-03	0.0	1.1911-03	8.8512-06
WATER	0.0	55.5084	0.2138	55.2946
COMPONENTS: MOLE FRAC				
NITRO-01	0.7808	0.0	0.7289	7.0392-06
OXYGE-01	0.2095	0.0	0.1955	3.6195-06
ARGON	9.3000-03	0.0	8.6799-03	1.7474-07
CARBO-01	4.0000-04	0.0	3.7071-04	1.6007-07
WATER	0.0	1.0000	6.6540-02	1.0000
COMPONENTS: KG/MIN				
NITRO-01	6.5619-02	0.0	6.5608-02	1.0904-05
OXYGE-01	2.0111-02	0.0	2.0105-02	6.4042-06
ARGON	1.1145-03	0.0	1.1142-03	3.8599-07
CARBO-01	5.2812-05	0.0	5.2422-05	3.8954-07
WATER	0.0	1.0000	3.8518-03	0.9961
COMPONENTS: MASS FRAC				
NITRO-01	0.7551	0.0	0.7231	1.0946-05
OXYGE-01	0.2314	0.0	0.2216	6.4289-06
ARGON	1.2826-02	0.0	1.2280-02	3.8748-07
CARBO-01	6.0775-04	0.0	5.7778-04	3.9104-07
WATER	0.0	1.0000	4.2452-02	1.0000
TOTAL FLOW:				
MOL/MIN	3.0000	55.5084	3.2132	55.2952
KG/MIN	8.6897-02	1.0000	9.0731-02	0.9962
CUM/SEC	1.1894-03	1.7011-05	1.3727-03	1.6902-05
STATE VARIABLES:				
TEMP C	22.0700	39.5800	38.2230	37.0128
PRES PA	1.0318+05	1.0193+05	1.0100+05	1.0225+05
VFRAC	1.0000	0.0	1.0000	0.0
LFRAC	0.0	1.0000	0.0	1.0000
SFRAC	0.0	0.0	0.0	0.0
ENTHALPY:				
J/KMOL	-2.4265+05	-2.8471+08	-1.5848+07	-2.8490+08
J/KG	-8377.2940	-1.5804+07	-5.6123+05	-1.5814+07
WATT	-12.1327	-2.6340+05	-848.6863	-2.6256+05

EXPT 280 - TRIAL 1A (++)

STREAM SECTION

1 2 3 4 (CONTINUED)

STREAM ID	1	2	3	4
ENTROPY:				
J/KMOL-K	4279.2491	-1.5959+05	4783.6603	-1.6020+05
J/KG-K	147.7346	-8858.3672	169.4111	-8892.4734
DENSITY:				
KMOL/CUM	4.2038-02	54.3861	3.9013-02	54.5249
KG/CUM	1.2177	979.7799	1.1016	982.2887
AVG MW	28.9658	18.0153	28.2370	18.0154

BLOCK STATUS

```
*****************************************************************************
*                                                                           *
* Calculations were completed normally                                      *
*                                                                           *
* All Unit Operation blocks were completed normally                         *
*                                                                           *
* All streams were flashed normally                                         *
*                                                                           *
*****************************************************************************
```