

Get Started Guide for New Users of Aspen Plus® V8.0

1. Lesson Objectives

- Learn to create a new Aspen Plus simulation
- Learn to construct flowsheet, including adding blocks and streams, reconnecting streams, and breaking/joining streams

2. Prerequisites

- Aspen Plus V8.0

3. Background

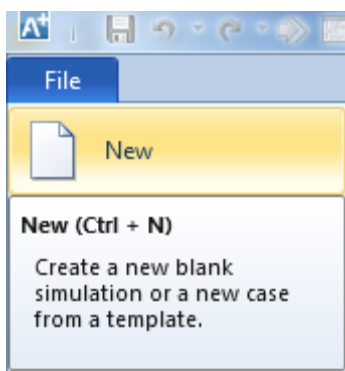
This tutorial is for first-time Aspen Plus users. It shows new users:

- How to launch Aspen Plus UI
- Where to specify components
- Where to specify physical property methods
- How to move from **Properties** environment to **Simulation** environment
- How to construct a flowsheet

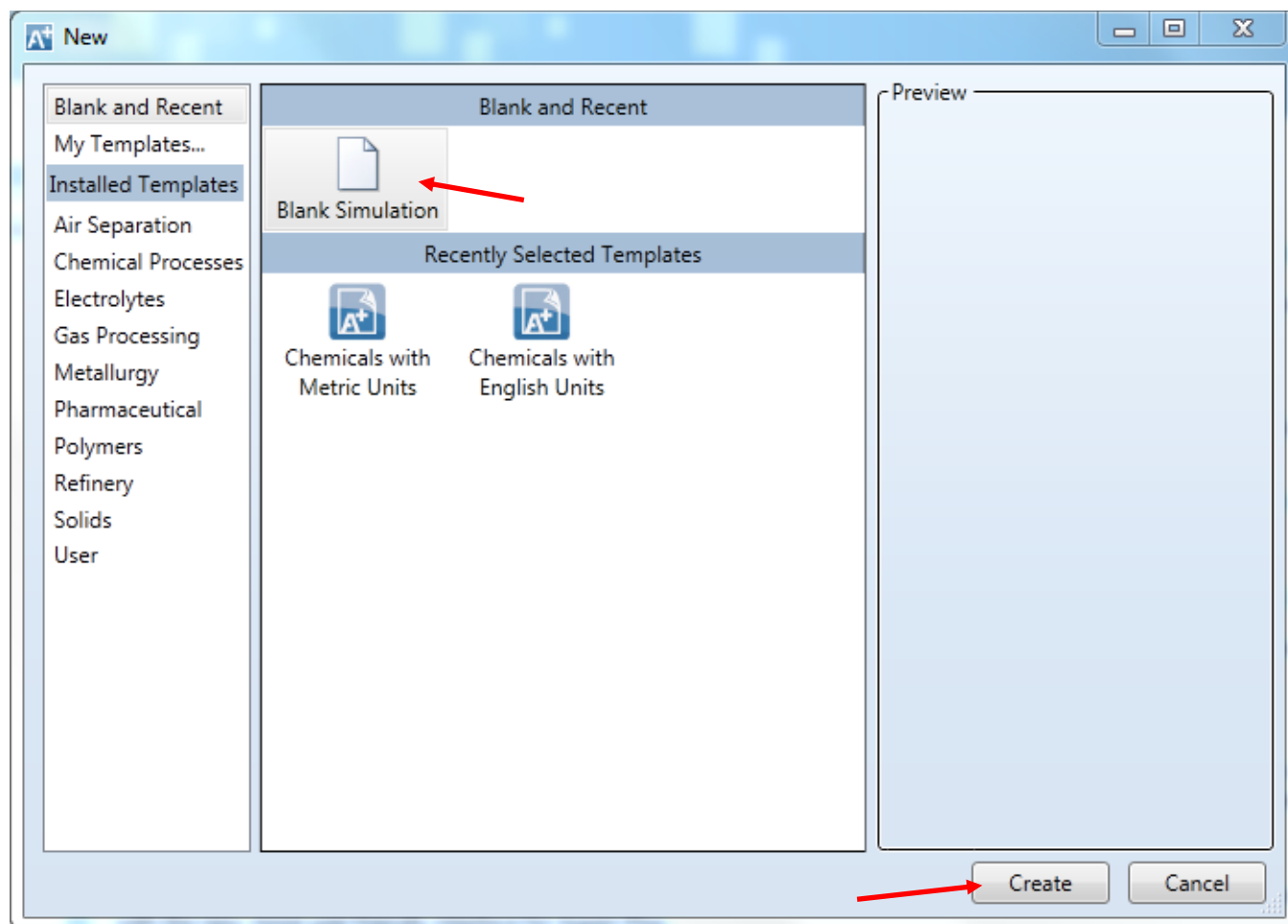
The examples presented are solely intended to illustrate specific concepts and principles. They may not reflect an industrial application or real situation.

4. Aspen Plus Solution

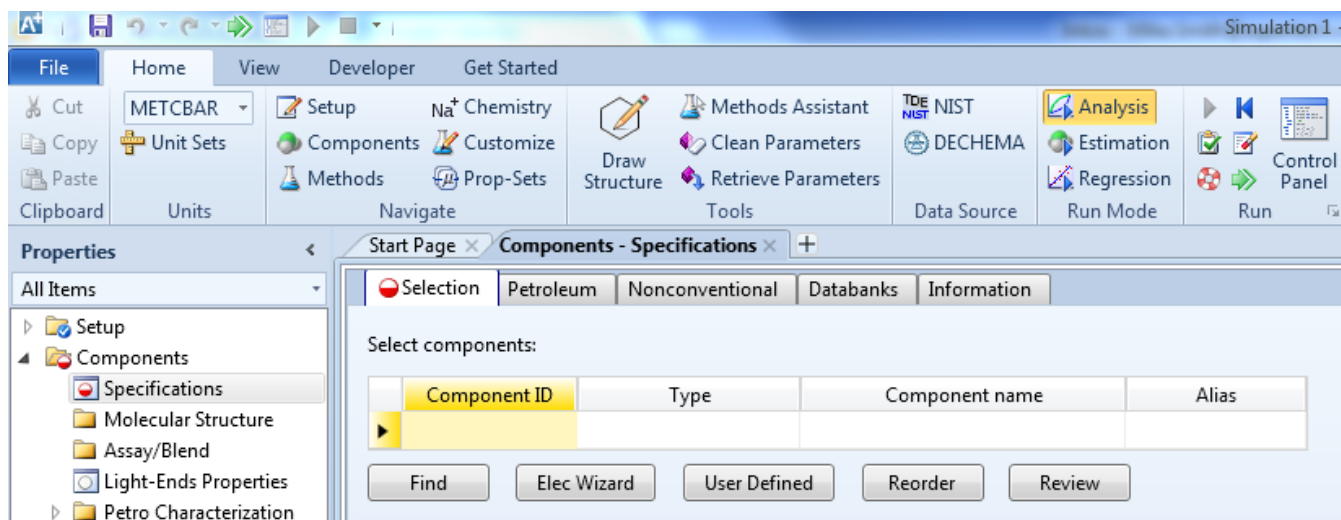
- 4.01. From your desktop, select **Start** and then select **Programs**.
- 4.02. Select **AspenTech**, then **Process Modeling V8.0** then **Aspen Plus**, and then **Aspen Plus V8.0** The Aspen Plus main window appears, showing the **Start Page**.
- 4.03. Start a new simulation by selecting **New** on the **File** tab of the ribbon or pressing **Ctrl+N**.



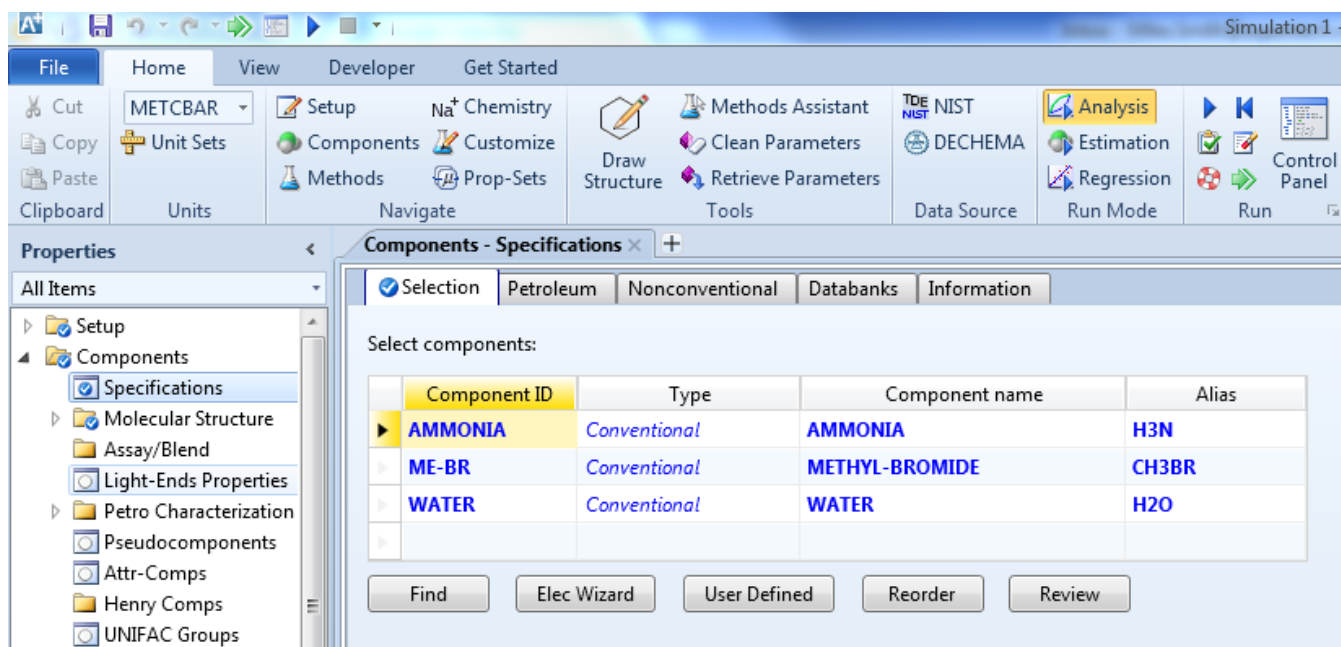
4.04. Doing so brings up this page. Click on **Blank Simulation** and then click **Create**.



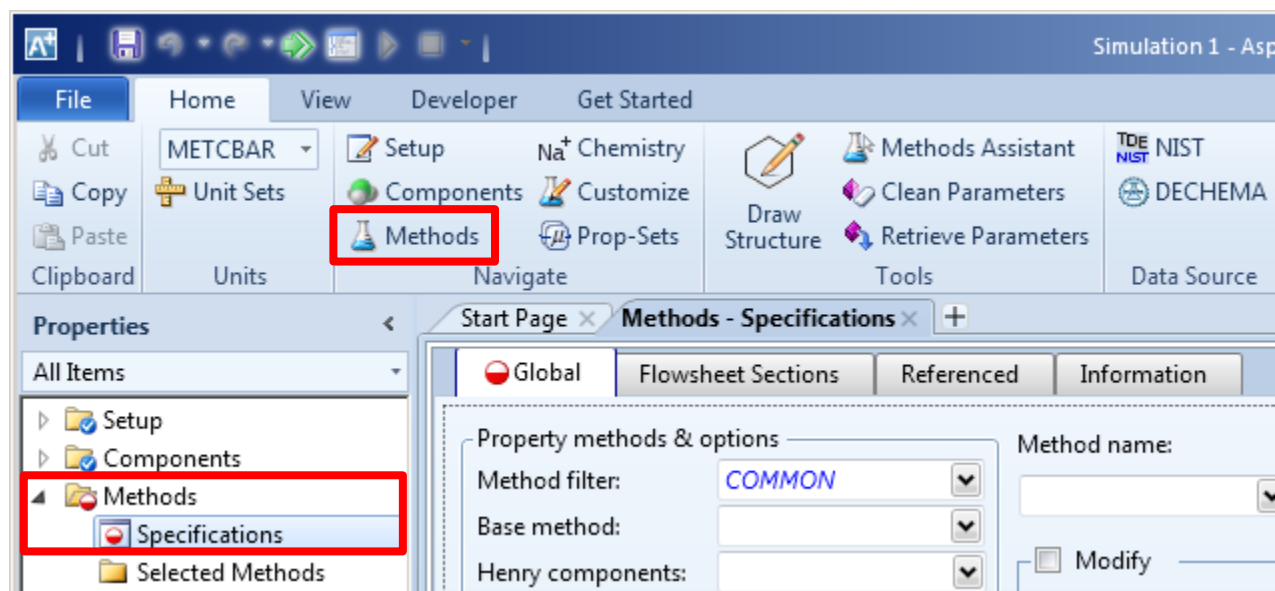
4.05. The following form comes up once the new simulation has been created. Enter the components that appear in the simulation.



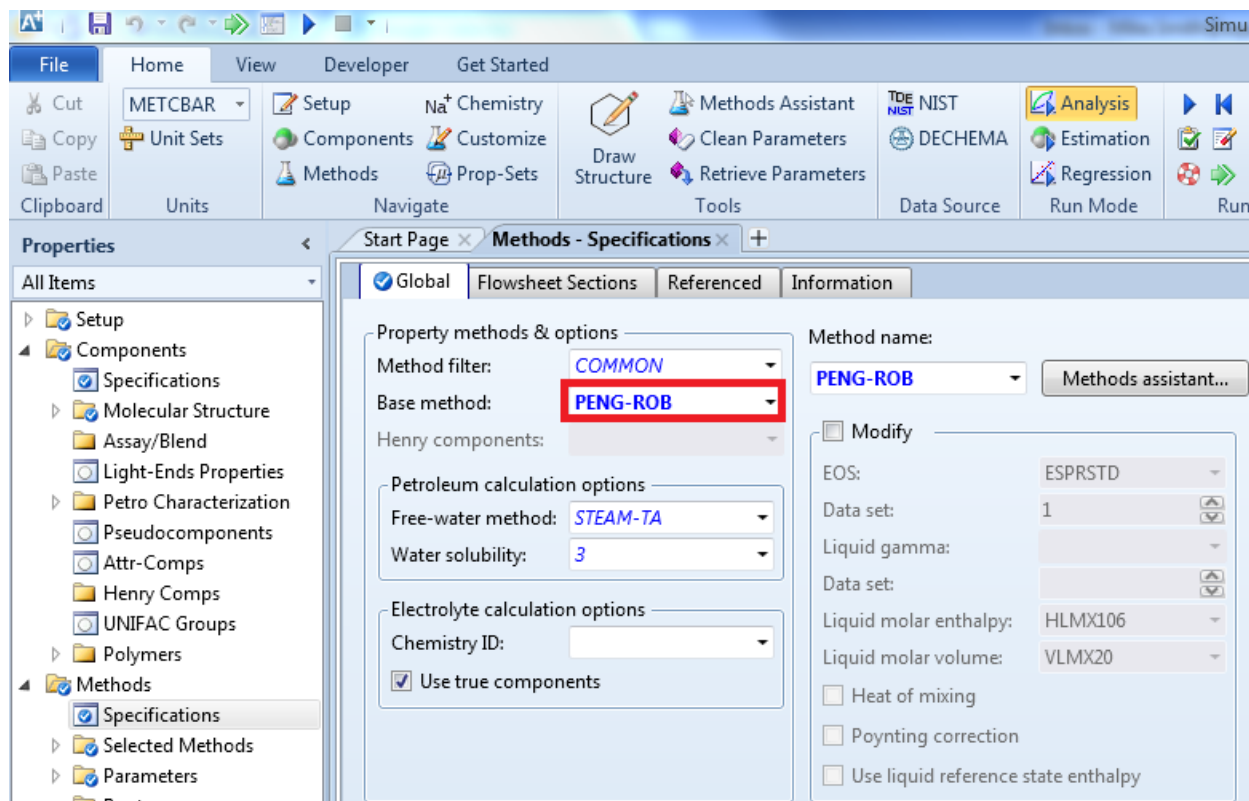
- 4.06. Enter **AMMONIA** in the **Component ID** field. Because ammonia is a commonly used (and unambiguously named) component, Aspen Plus fills in the **Component name** and **Alias** fields.
- 4.07. Enter **ME-BR** in the second row under **Component ID**. Enter **METHYL-BROMIDE** in the **Component name** column for this row. Aspen Plus recognizes this component name, and so it fills in the **Alias** field. If a component cannot be added by typing in the ID or name, click on the **Find** button to search for it.
- 4.08. Enter **WATER** in the third row under **Component ID**. Aspen Plus fills in the **Component name** and **Alias** fields again. A **Component ID** is simply a handle for the user and so can be arbitrarily assigned; Aspen Plus uses **Component name** to identify the component and find the necessary data for the simulation.



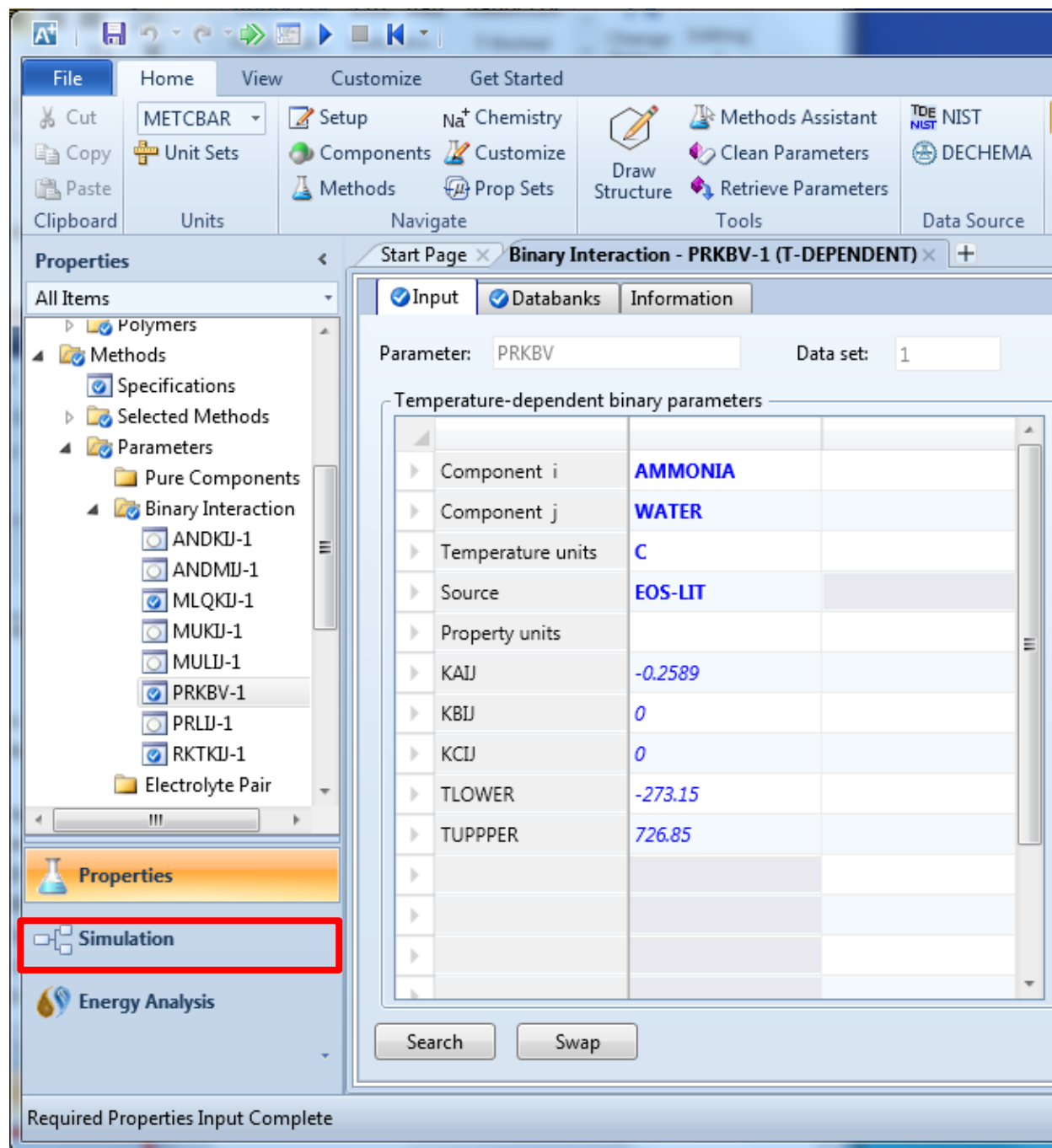
- 4.09. Specify the property methods to be used in the simulation by clicking on the **Methods** button in the **Navigate** group in the **Home** tab of the ribbon. Alternatively, click the **Methods** node in the navigation pane.



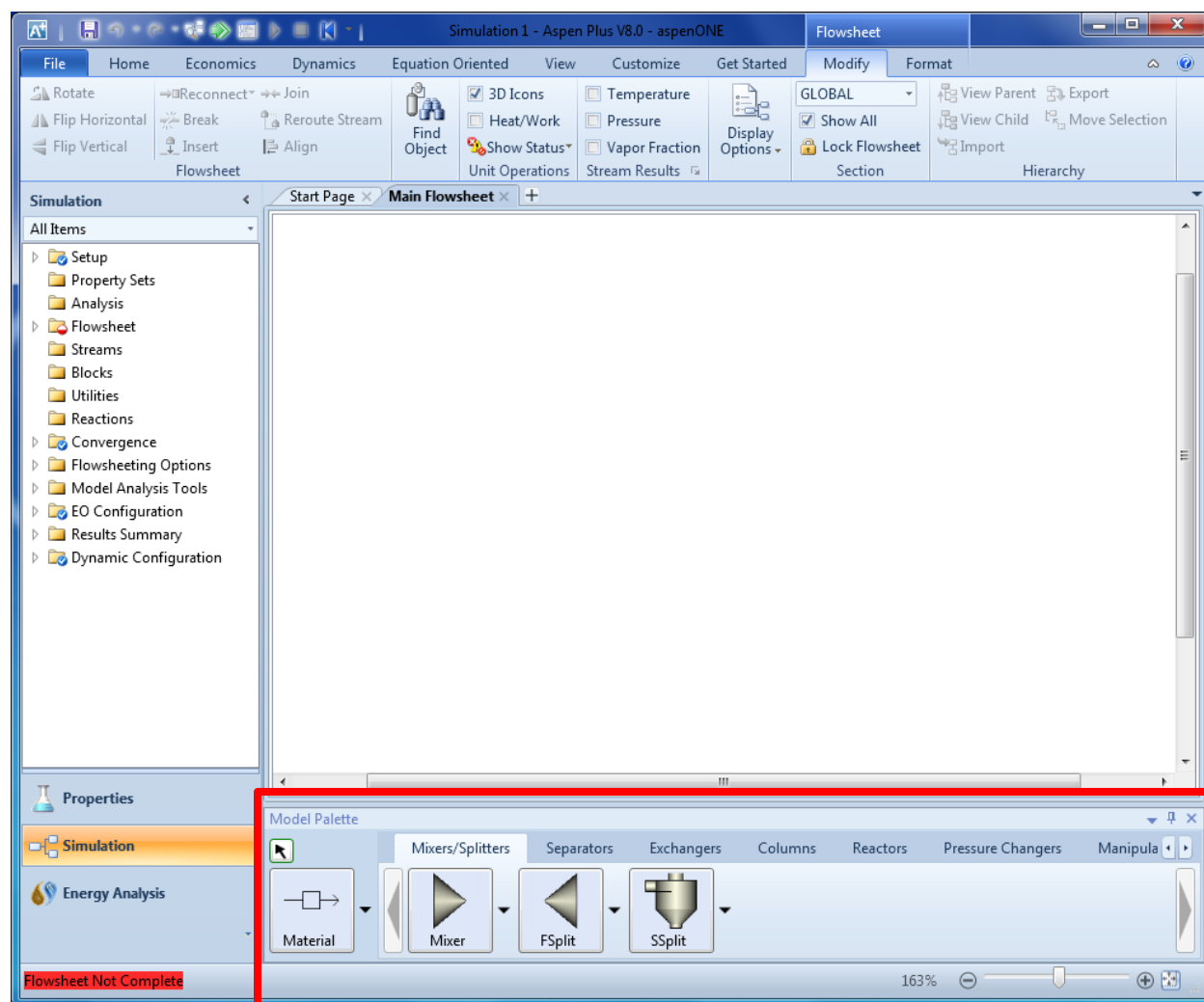
- 4.10. Doing so brings up the following form. Select **PENG-ROB** (Peng-Robinson equation of state) in the **Base method** field.



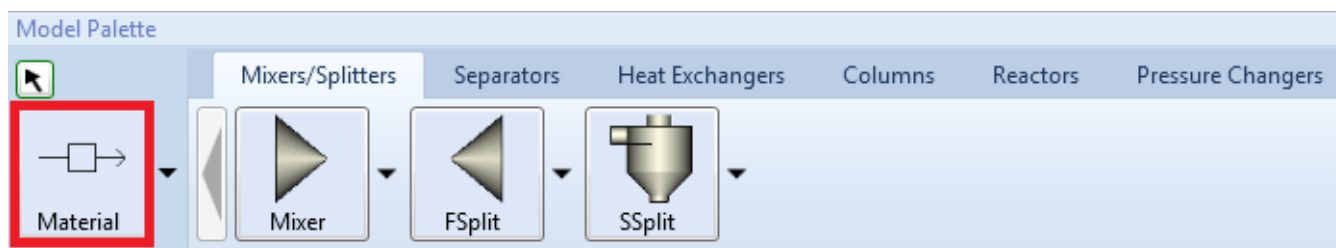
- 4.13. Enter the simulation environment. Press the **Simulation** bar in the navigation pane on the left side of your screen.



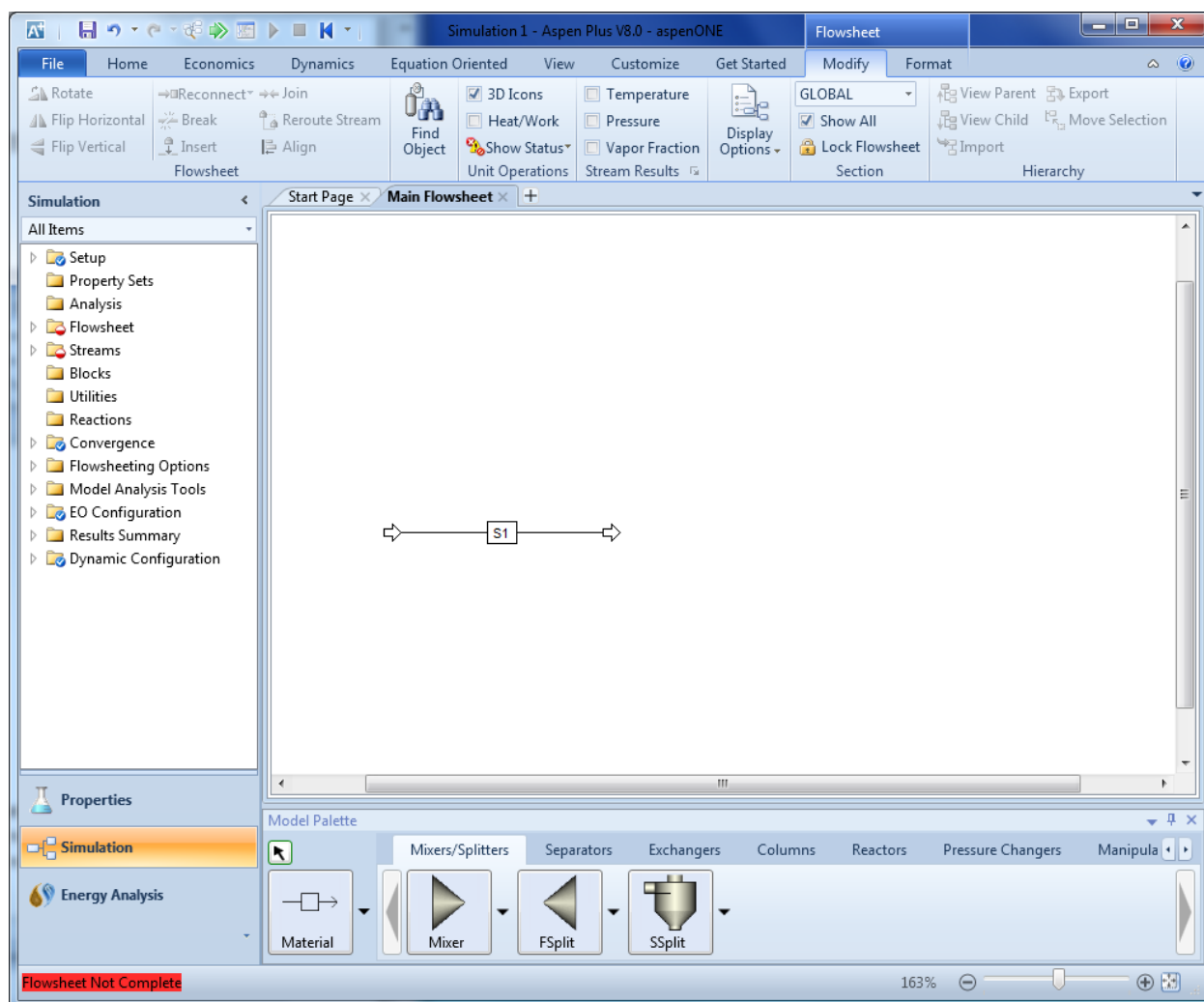
- 4.14. The simulation environment is shown below. The **Model Palette** is outlined in red below and a blown up image of just the palette appears in the next figure.



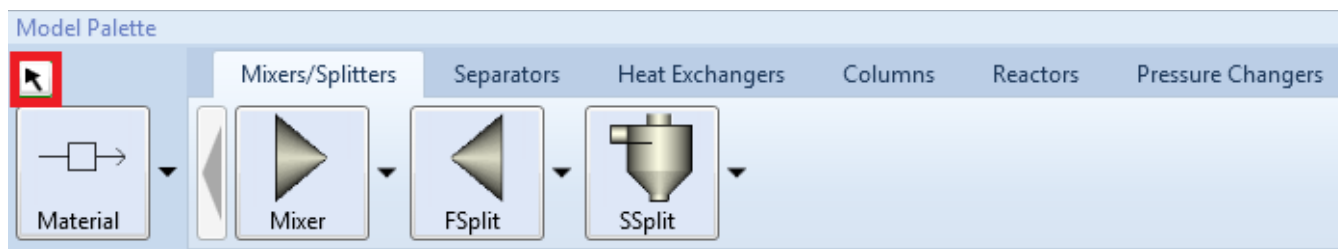
- 4.15. Create a stream in the flowsheet. Click on the **Material** button (outlined in red below) in the **Model Palette**. Now, the mouse is in the insert mode.



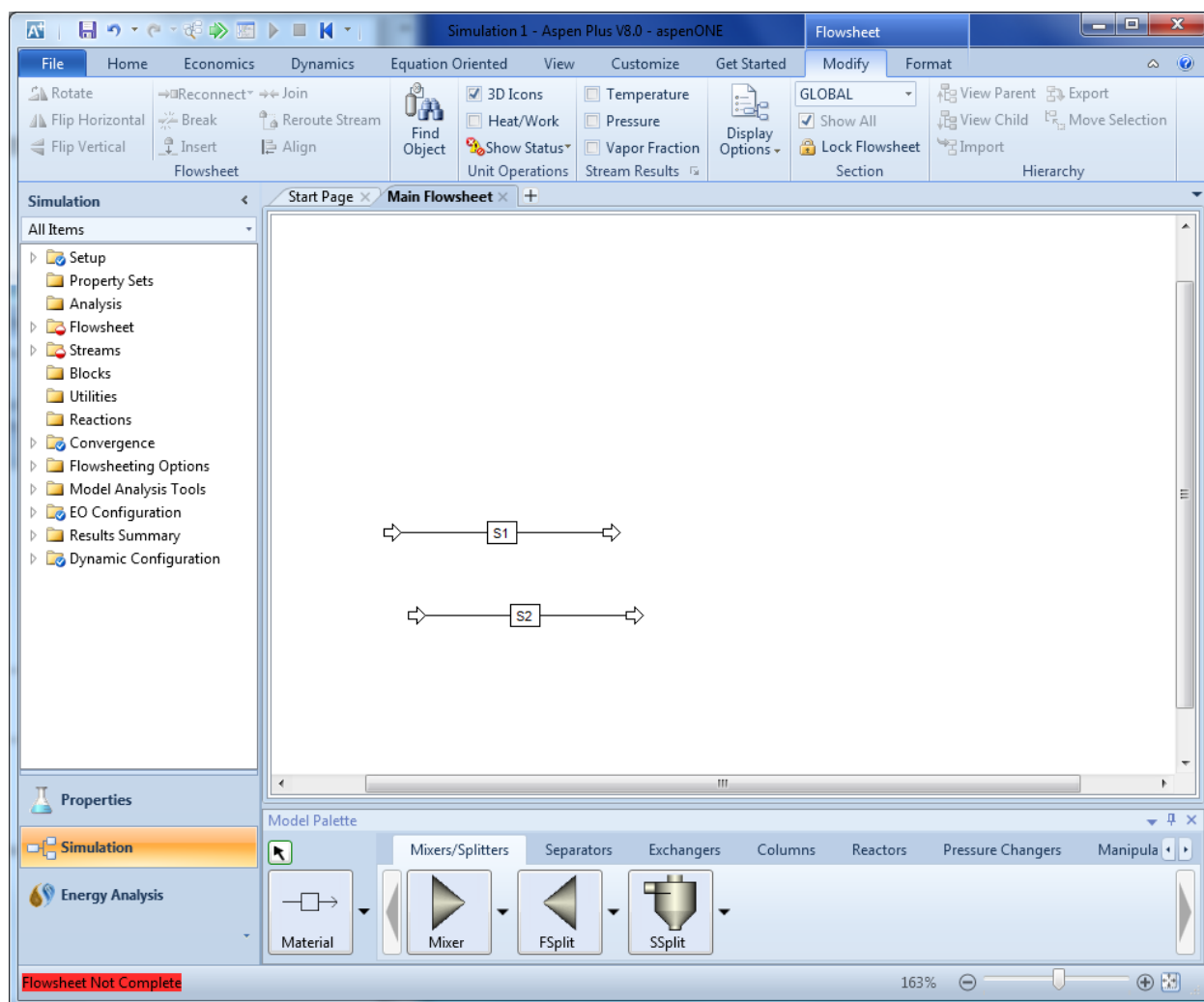
- 4.16. Click on the flowsheet area in two different spots (one for stream source and again for stream destination). A stream **S1** is drawn in the flowsheet area. The mouse is still in the insert mode. Clicking in the flowsheet area again will make another stream.



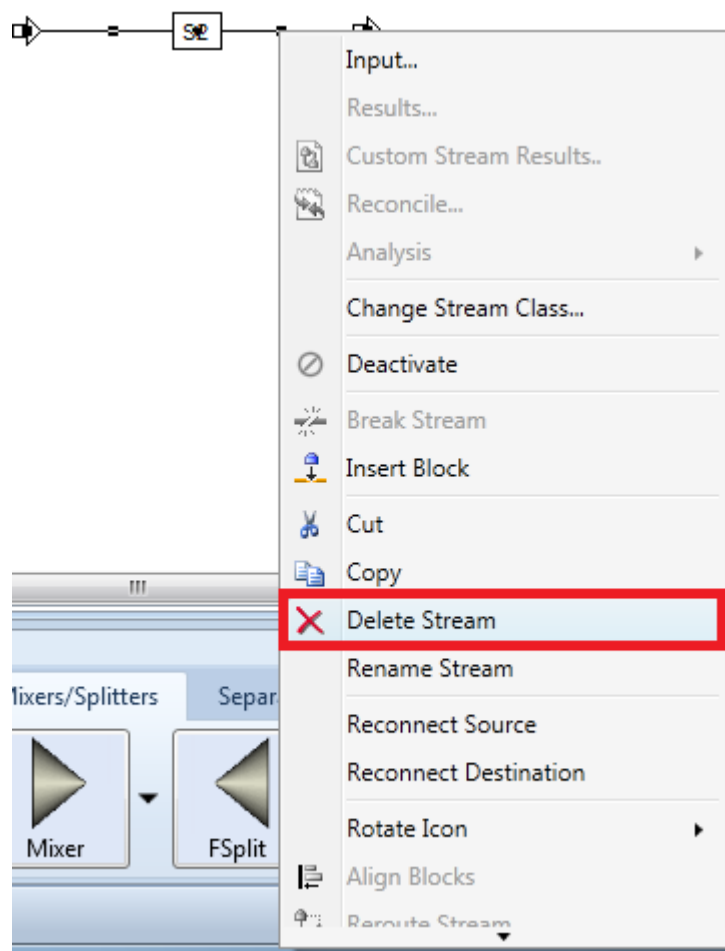
- 4.17. Cancel insert mode. To exit the insert mode, click the **Cancel insert mode** button (outlined in the red box below) in the **Model Palette**. Alternatively, right-click on the main flowsheet to cancel insert mode. Note that the cursor changes shape when you enter or exit insert mode. It is a “plus” sign in insert mode, and an arrow when not in insert mode.



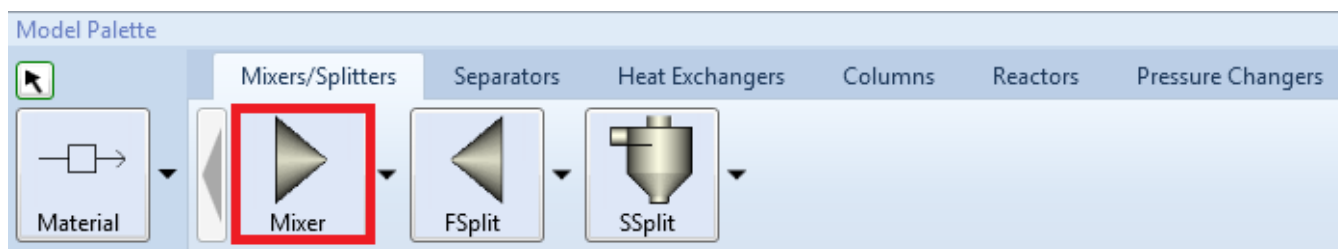
- 4.18. Add and delete a stream. Add another stream in the same way as step 4.15. The flowsheet will look like the screenshot below.



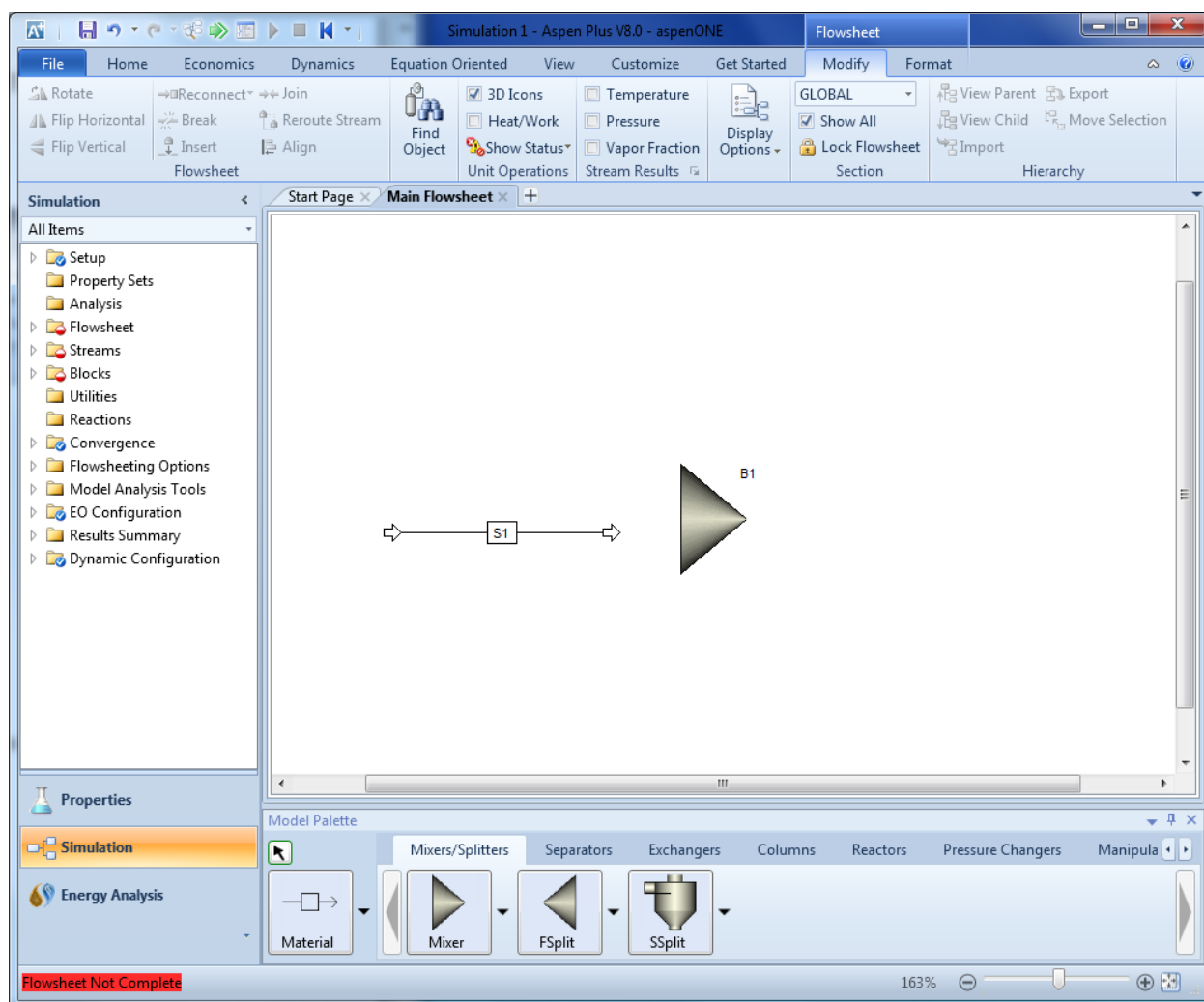
- 4.19. Delete **S2** by right-clicking it and selecting **Delete Stream**. Streams can also be deleted by clicking on the stream and pressing the **Delete Key**.



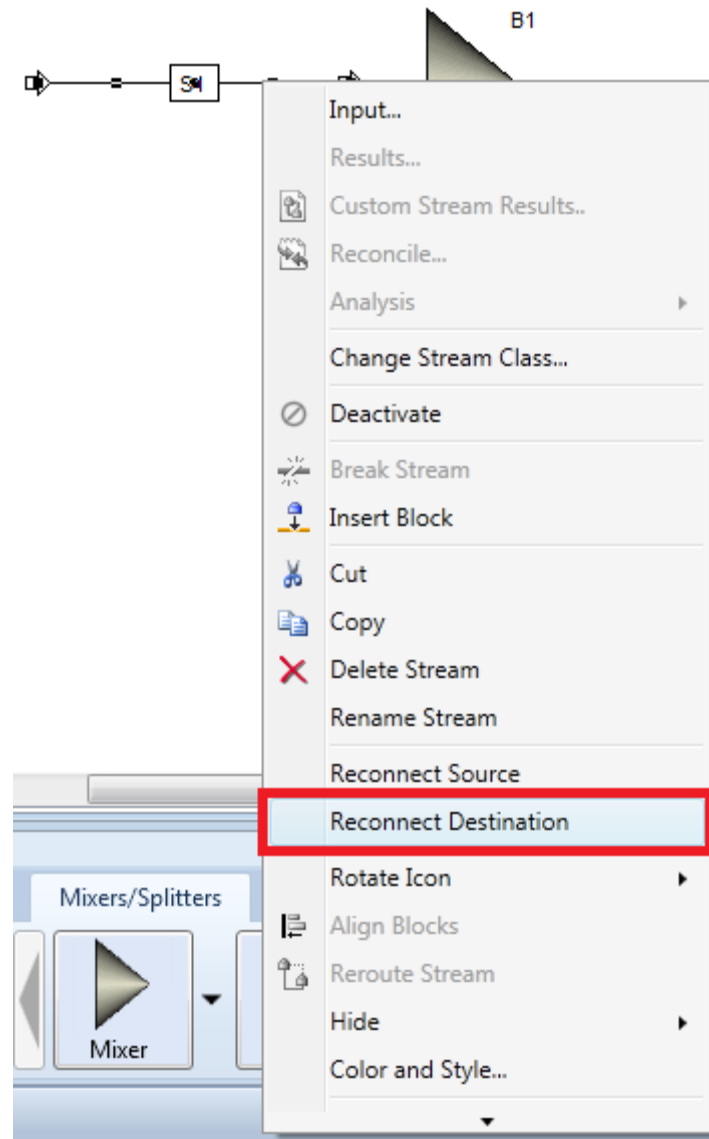
- 4.20. Add a mixer to the flowsheet. Click on the **Mixer** button in the **Mixers/Splitters** sheet of the **Model Palette**, and then click on the flowsheet area. Cancel insert mode so more clicks do not add more mixer blocks.



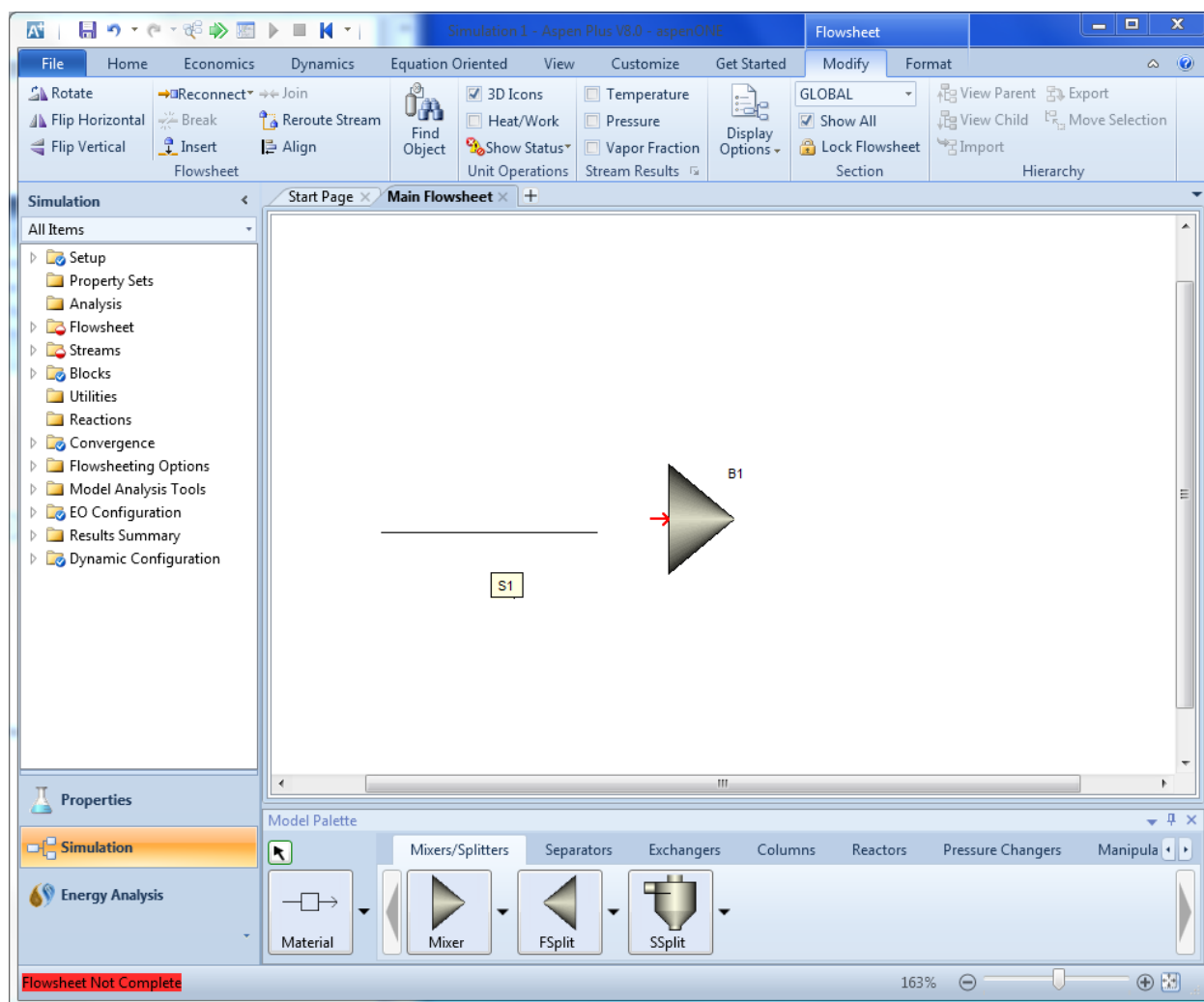
- 4.21. The flowsheet will look like the screenshot below.



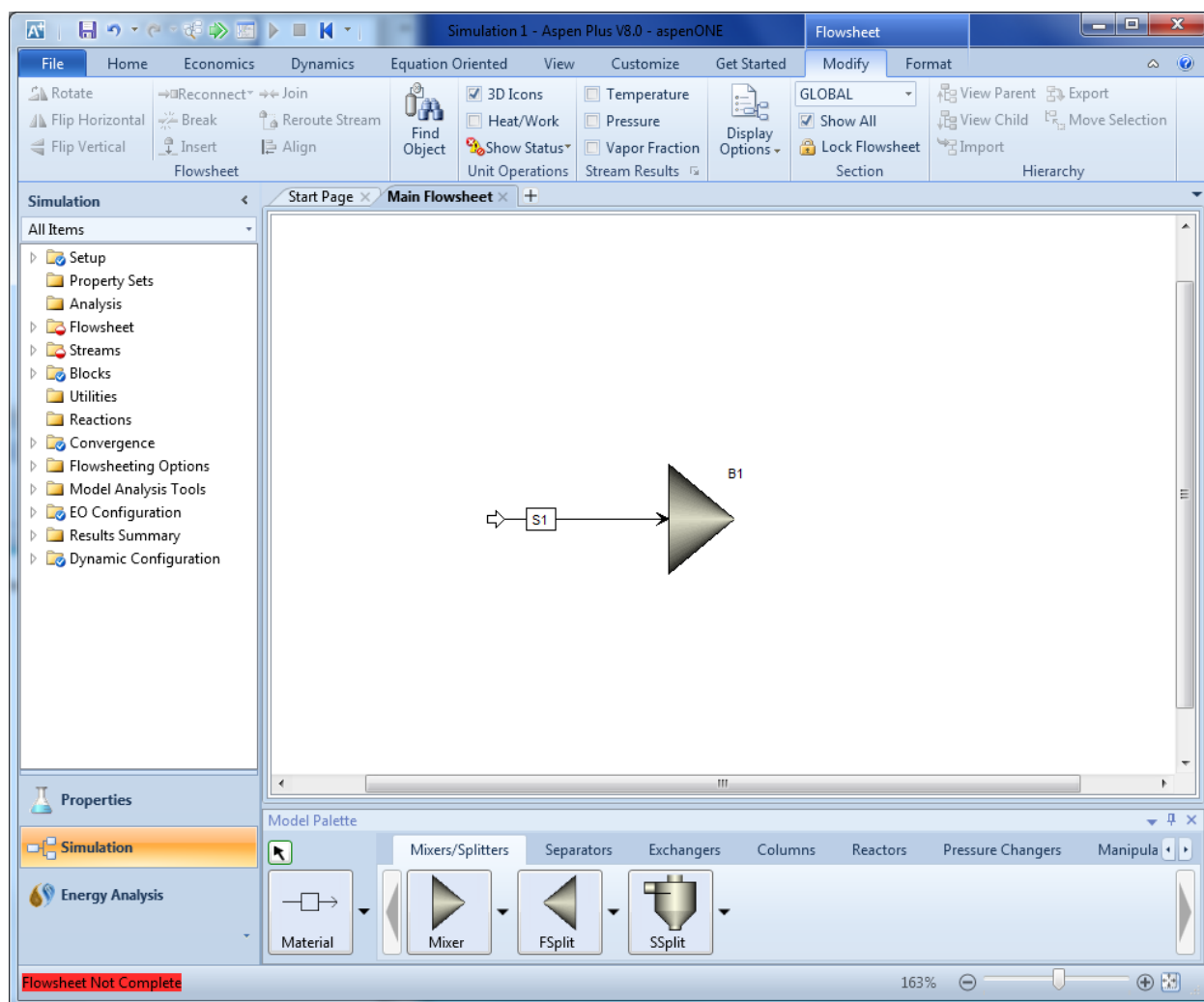
4.22. Connect the stream to the block. Right-click on the stream and click **Reconnect Destination**.



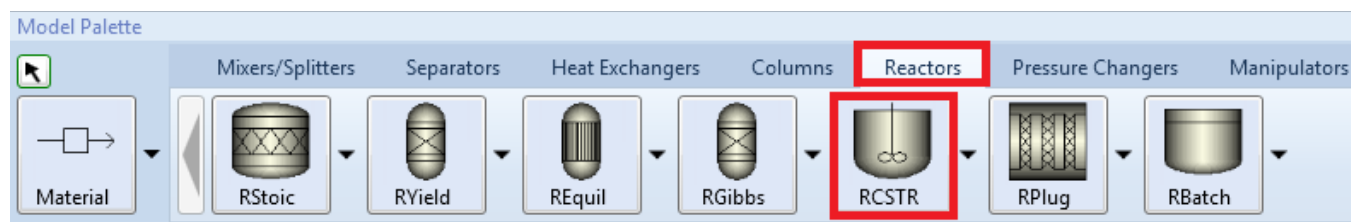
- 4.23. **B1**'s inlet port (a red arrow attached to the left side of **B1**) is displayed. Note that red arrows represent ports that must be connected with streams. Blue arrows represent ports for optional streams.



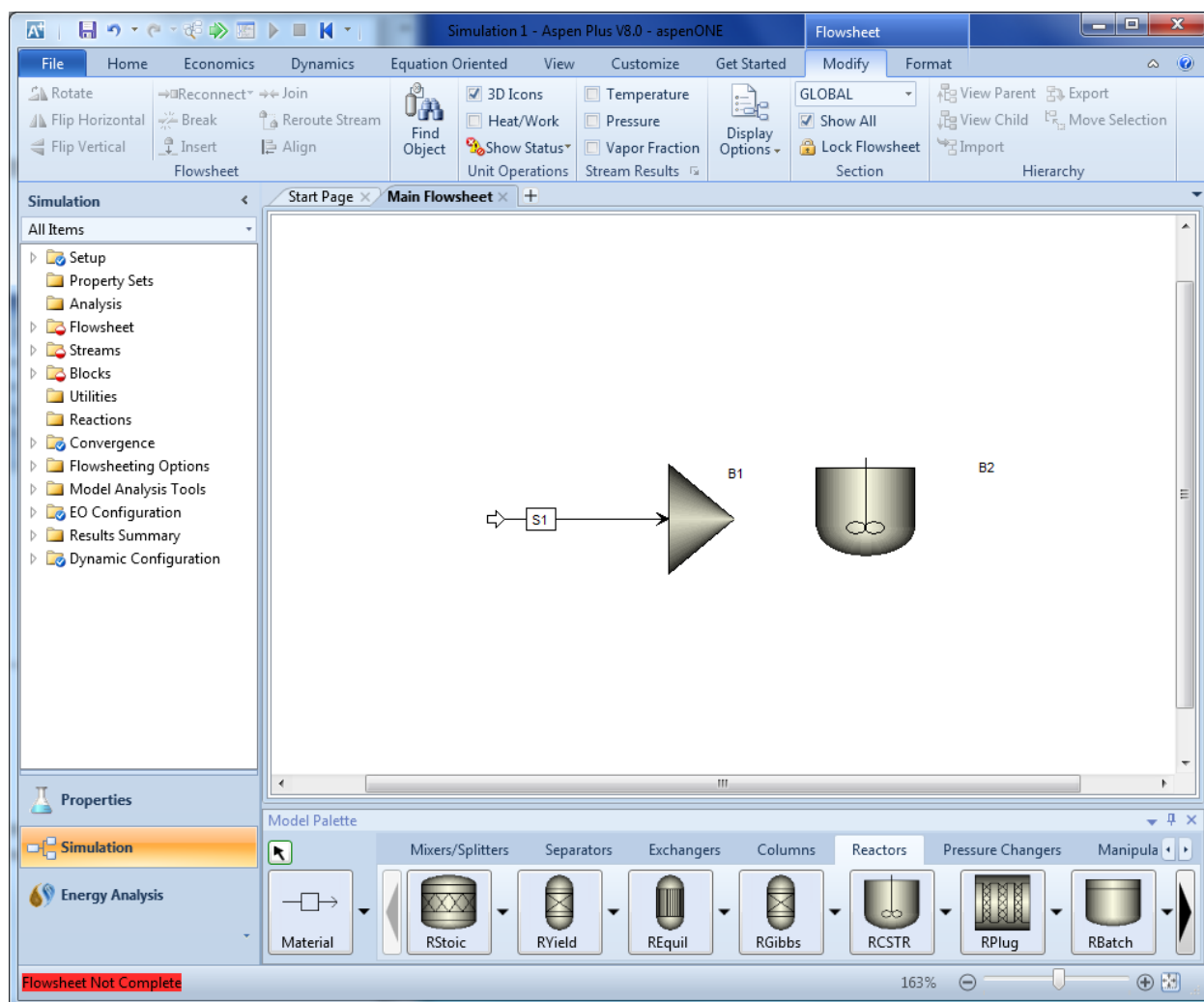
- 4.24. Clicking this inlet port connects stream **S1** to block **B1**. The flowsheet will look like the screenshot below.



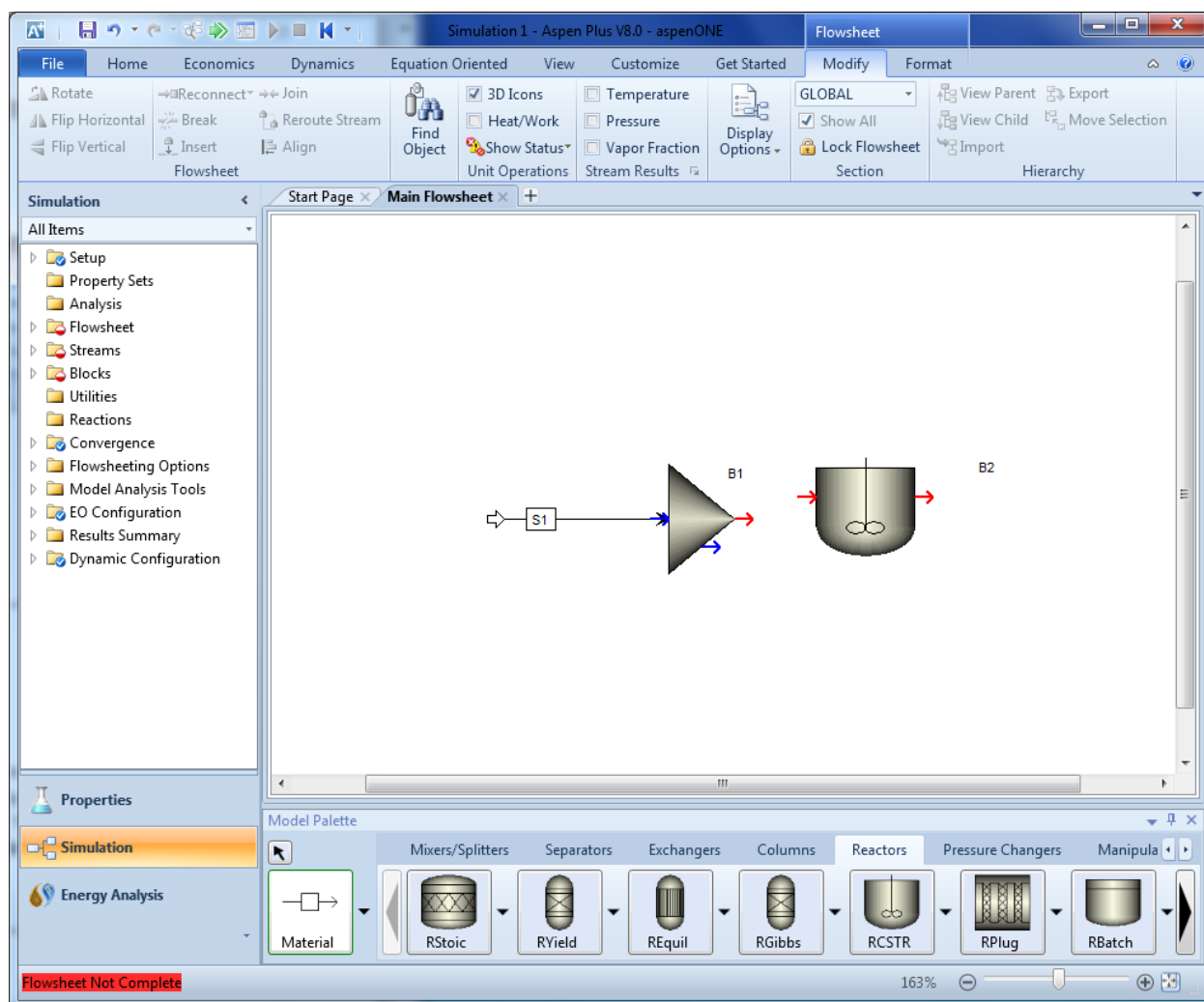
- 4.25. Add a reactor to the flowsheet. Click on the **Reactors** sheet of the **Model Palette**. Click on the **RCSTR** button.



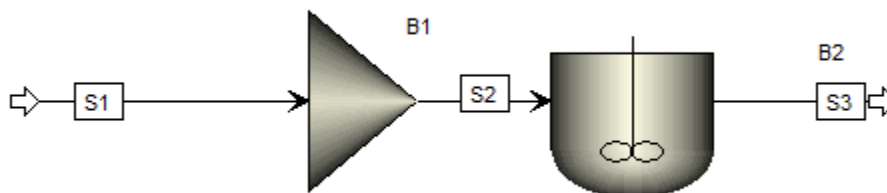
- 4.26. In the flowsheet area, click on the area on the right side of **B1**. A **RCSTR** block B2 is placed on the flowsheet as shown below. Now, cancel insert mode.



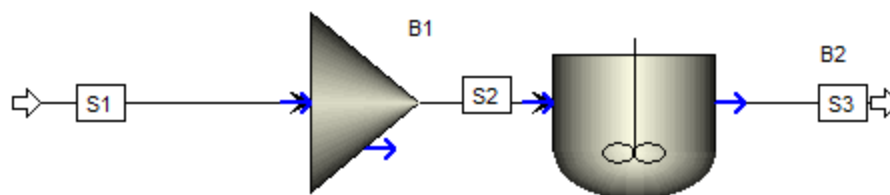
- 4.27. Connect the mixer to the reactor. Click on the **Material** button in the **Model Palette**. Doing so will show all available inlet and outlet ports. Again, red ports are ports that require stream connections, blue are optional.



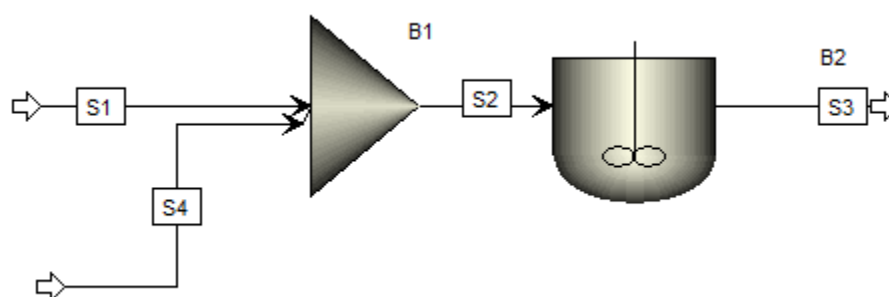
- 4.28. Click on the red arrow pointing out of **B1** and then click the red arrow pointing into the reactor. Now, **B1** and **B2** are connected with a stream. Add an effluent stream by clicking on the red arrow coming from the reactor and then click on a blank spot on the right of **B2**. The flowsheet should look like the screenshot below. The label for **S3** is hidden because the **B1** and **B2** are so close together.



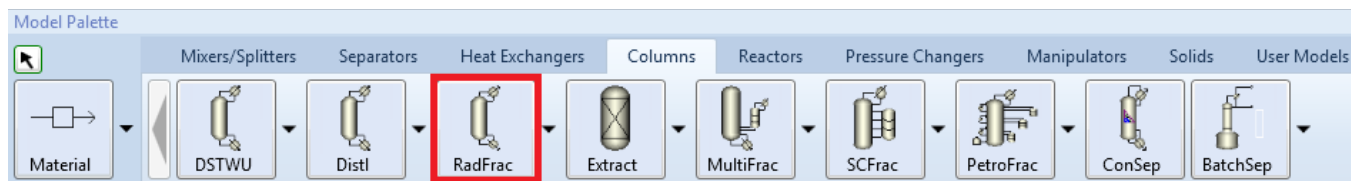
- 4.29. Clicking on the **Material** button in **Model Palette** again shows that there are only blue arrows: all required ports have been connected with streams.



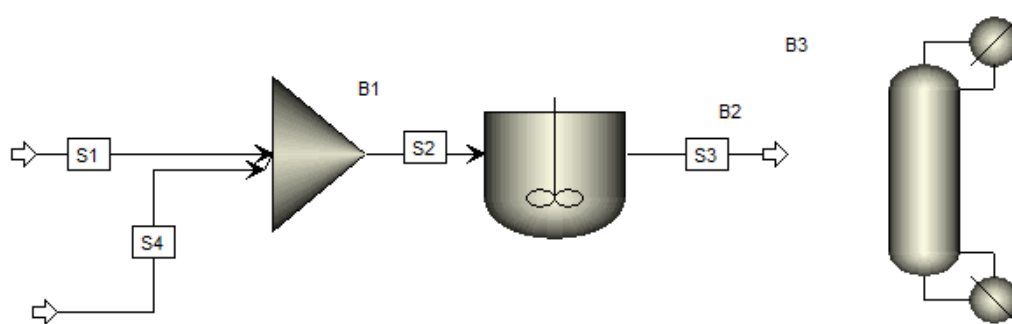
- 4.30. Add a second feed stream to the mixer. Click on the **Material** button in **Model Palette**, click on the blue arrow pointing into the mixer, and then click a blank spot in the flowsheet. The flowsheet will look like the screenshot below.



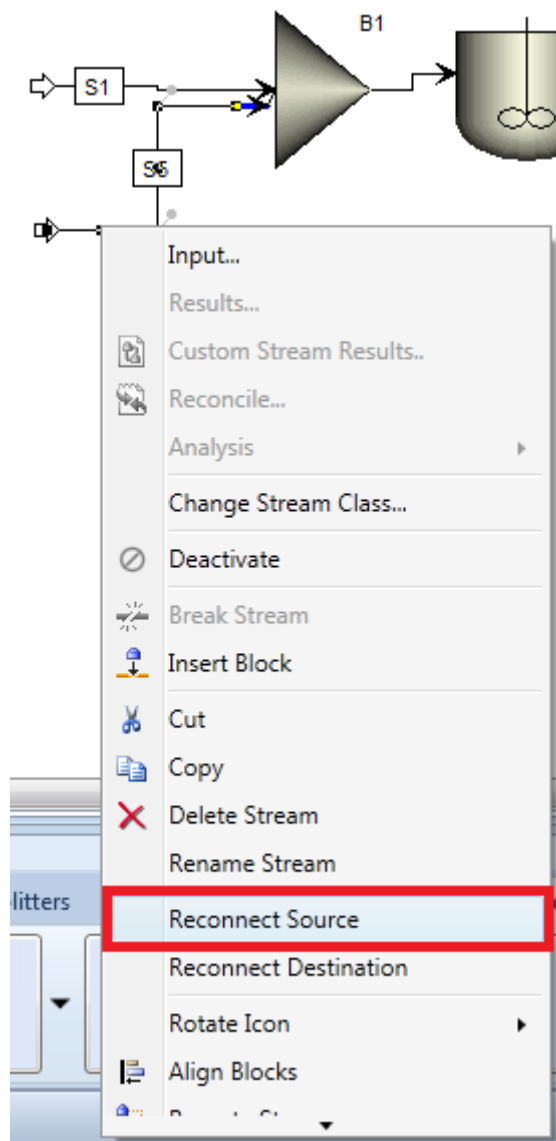
- 4.31. Add a distillation column. Click to the **Columns** sheet of the **Model Palette**. Click on the **RadFrac** button.



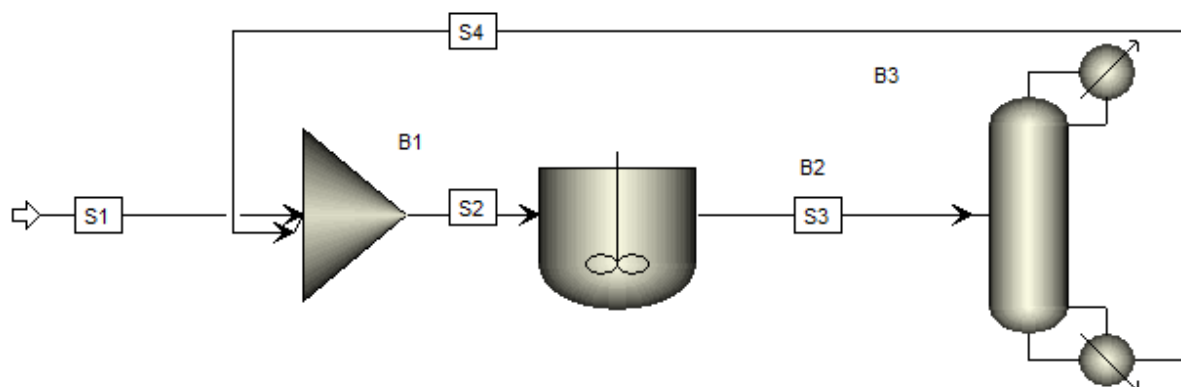
- 4.32. Click on the flowsheet to add the column. The flowsheet will look like the screenshot below.



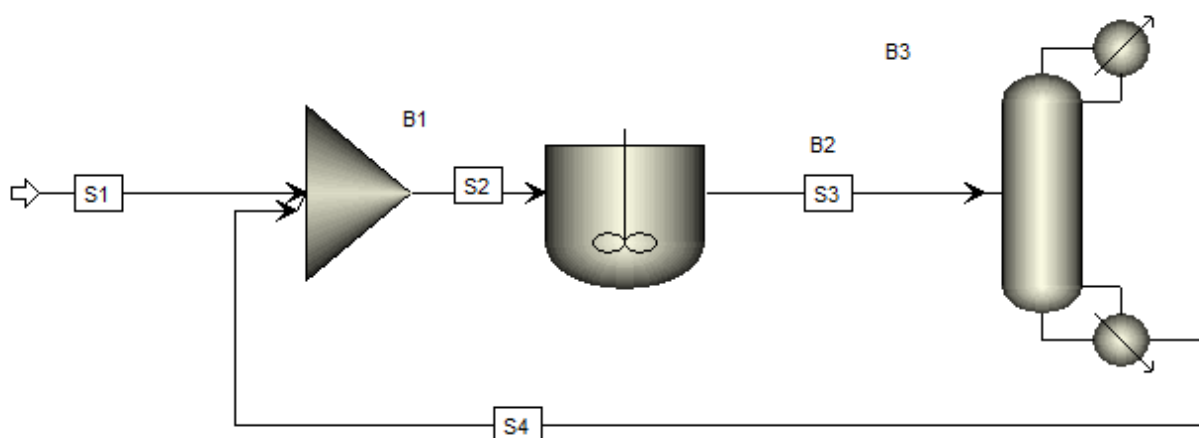
- 4.33. Reconnect the destination of stream **S3**. Either right-click **S3** and select **Reconnect Destination** or double click the white arrow at the right end of **S3**, and then click the red arrow pointing into the column.
- 4.34. Reconnect stream source to create recycle stream. Right-click **S4** and select **Reconnect Source**.



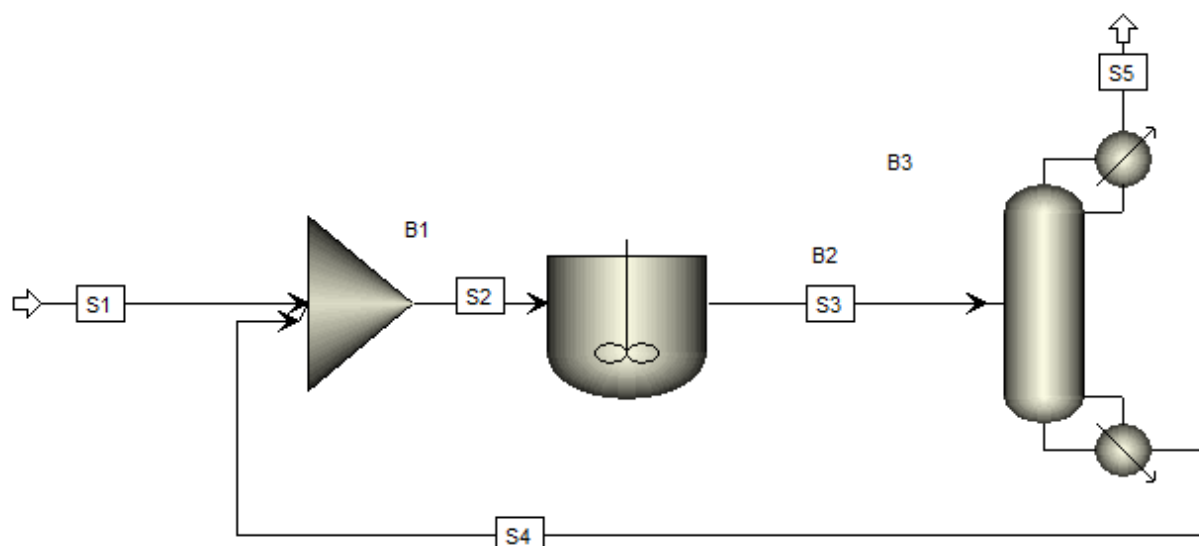
- 4.35. Click on the red arrow coming out from the bottom of the column. The flow sheet will look like the screenshot below.



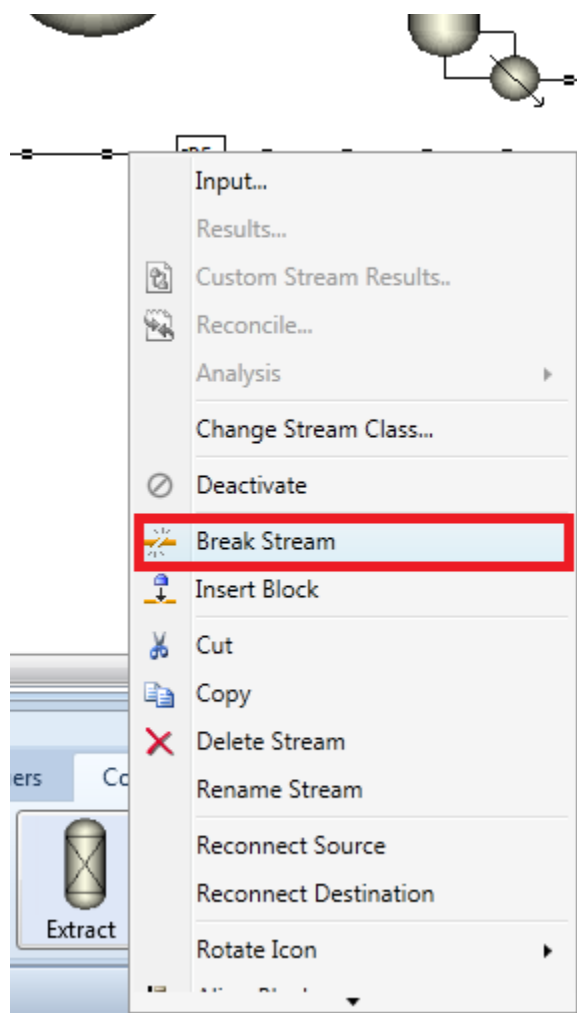
- 4.36. Move the recycle stream by clicking and dragging so that the stream is below the blocks. Having a clean flowsheet becomes very important when there are many blocks and streams.



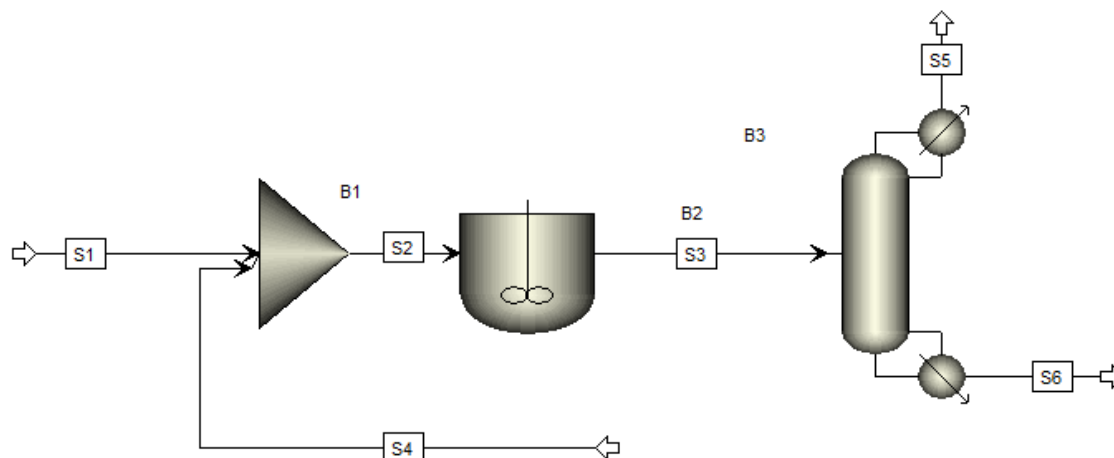
- 4.37. Add a stream coming from the top of the column.



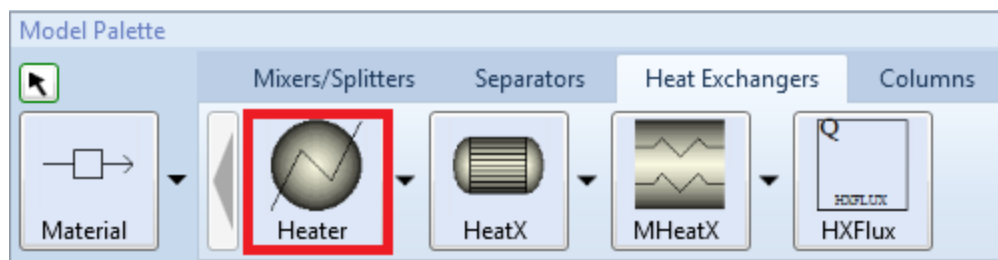
- 4.38. Add a heater for the recycle stream **S4**. Break the recycle stream **S4** by right-clicking on it and selecting **Break Stream**.



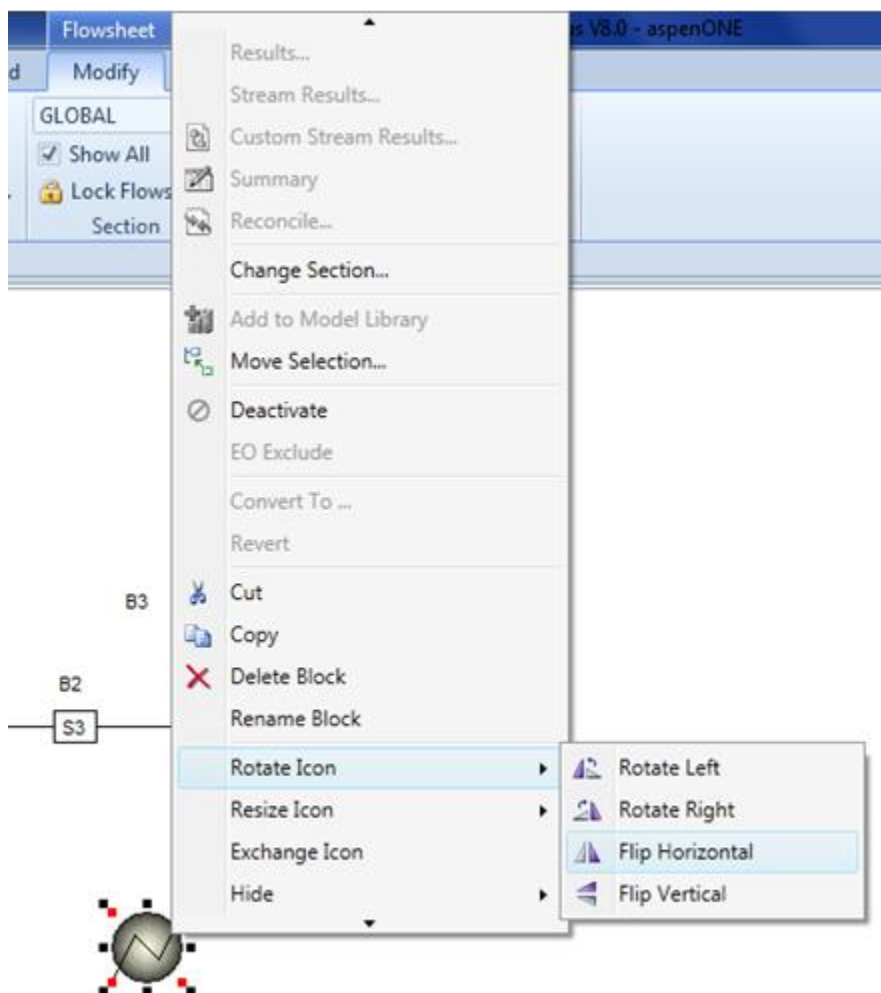
- 4.39. The flowsheet will look like the screenshot below.



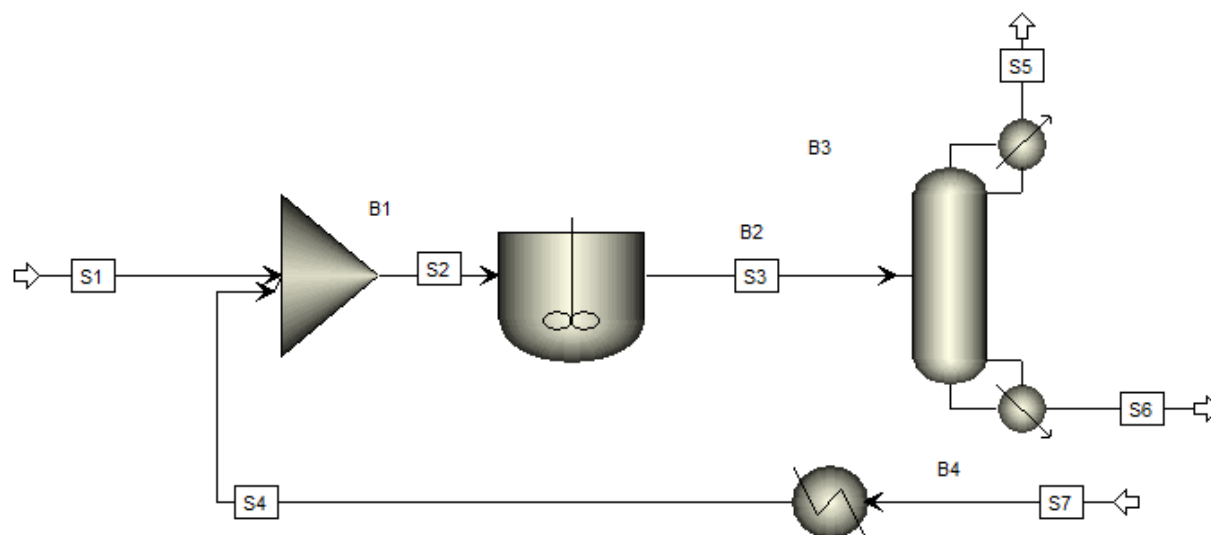
- 4.40. Click on the **Heat Exchangers** sheet of the **Model Palette**. Click the **Heater** button. Add it to the flowsheet below the reactor.



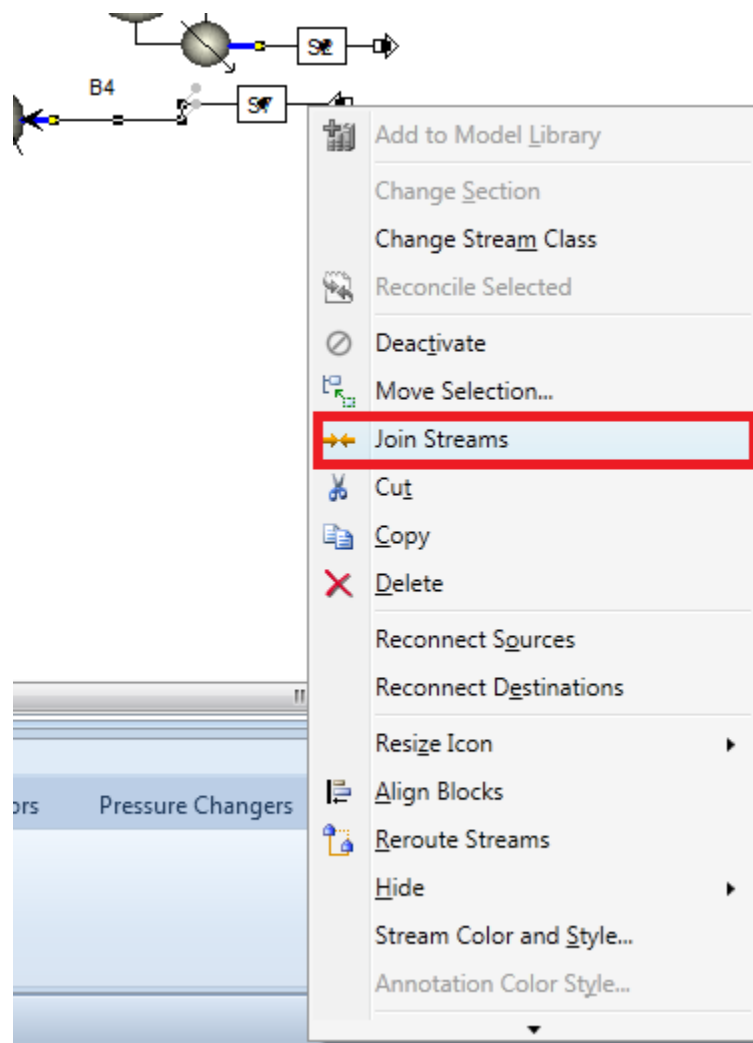
- 4.41. Blocks in Aspen Plus typically have inlets on the left side and outlets on the right side. For **B4**, we need its inlet to enter on the right side and its outlet to exit on the left side. Right-click on **B4** and select **Rotate Icon | Flip Horizontal** as shown below.



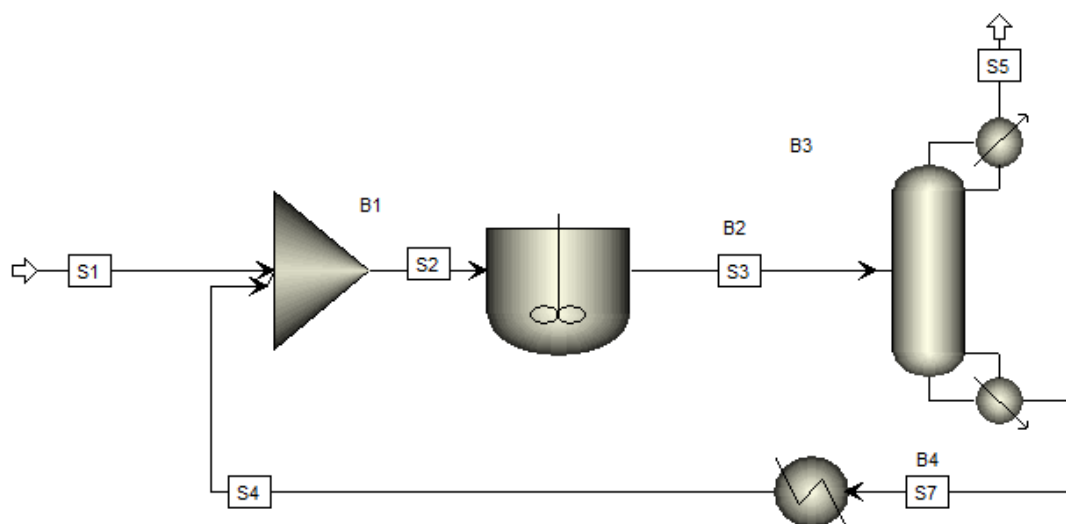
- 4.42. Connect the outlet of the heater to the mixer by reconnecting the source of **S4**. Create a stream going to the inlet of **B4**. The flowsheet will look like the screenshot below.



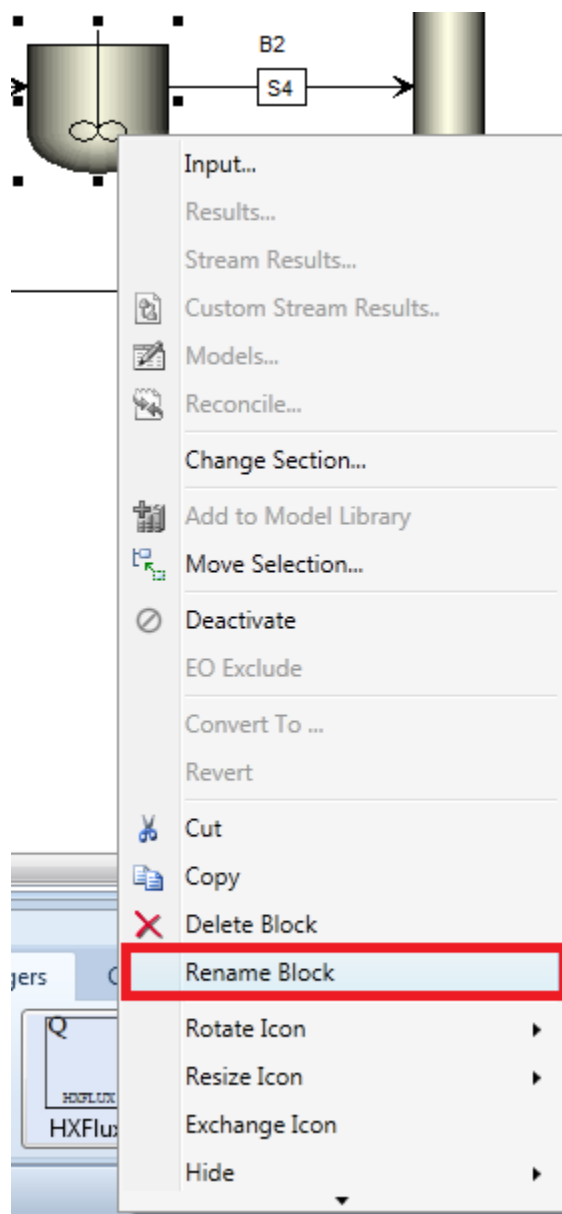
- 4.43. Join the streams to complete the recycle loop. Click on stream **S6**, press and hold the **Ctrl** key on your keyboard, and then, click **S7**. Then, release the **Ctrl** key on your keyboard. Both **S6** and **S7** are selected. Right-click one of them and select **Join Streams**.



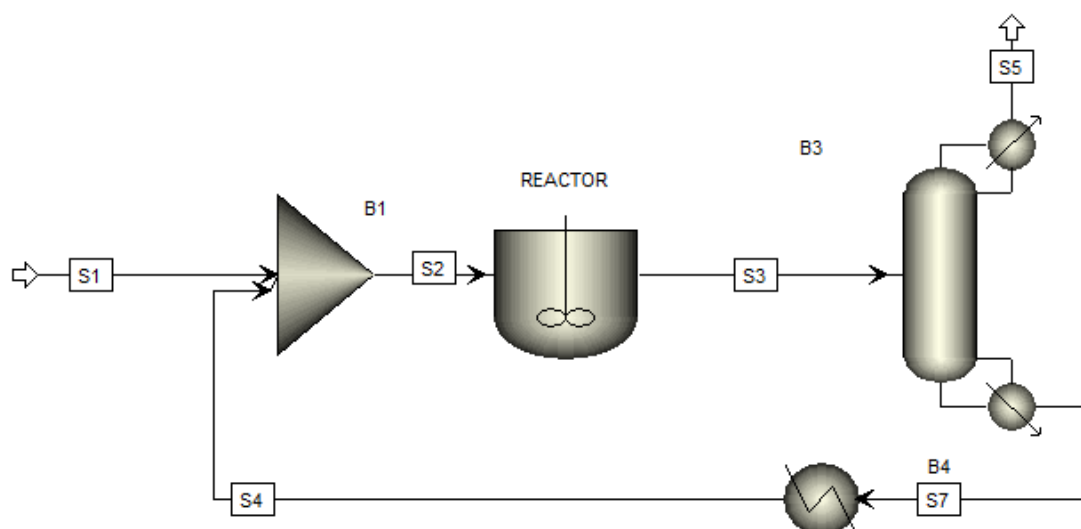
4.44. The flowsheet will look like the screenshot below.



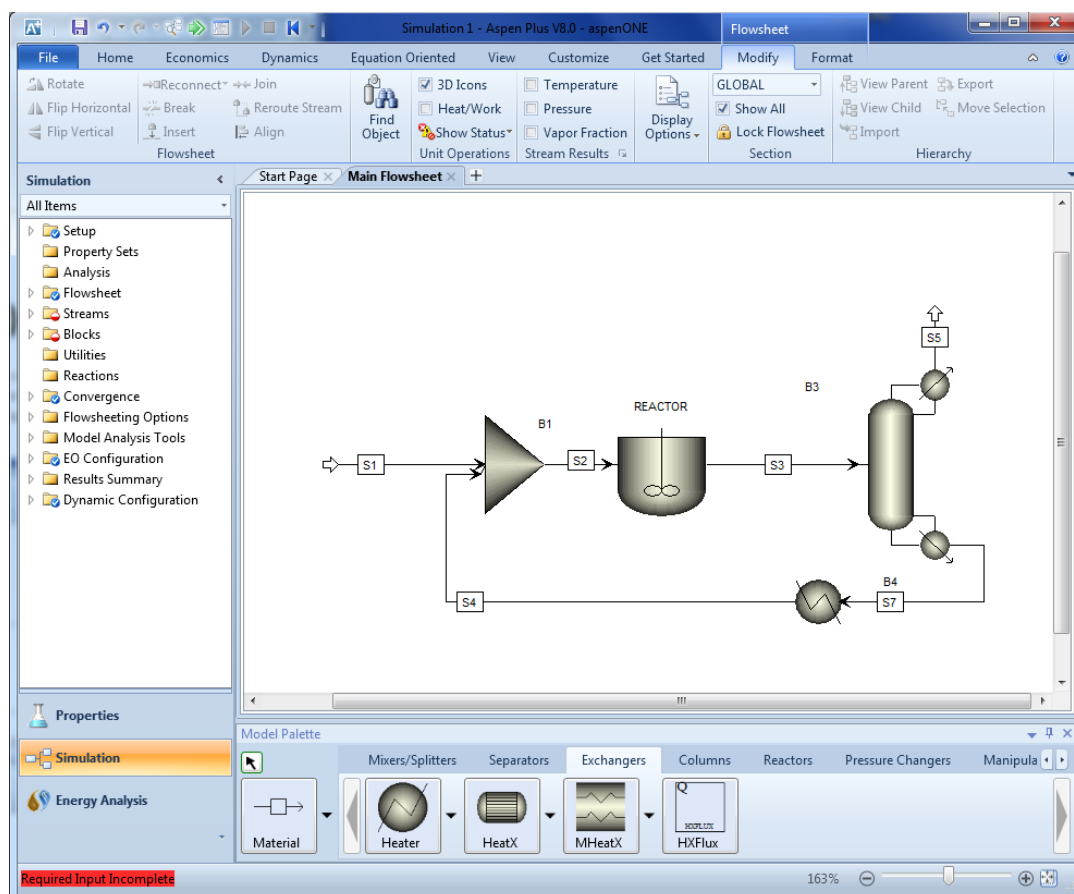
- 4.45. Rename a block. Right-click on **B2** and select **Rename Block**. Enter a new name, like **REACTOR**. Both streams and blocks can be renamed in this way. Alternatively, a block can be renamed by clicking on the block and pressing **Ctrl+M**. A stream can be renamed in a similar way.



- 4.46. You can see the renamed block in the screenshot below.



- 4.47. Reset the view in the main flowsheet. Pressing the **Home** key resets the view so the whole flowsheet fills the view. This is shown in the screenshot below. We have drawn our flowsheet. Hitting **F4** key will bring you to the first incomplete form and you can start entering specifications (e.g., stream conditions) for the simulation.



5. Conclusions

After going through steps described in this tutorial, first-time Aspen Plus users should be able to follow the steps of our examples.

6. Copyright

Copyright © 2012 by Aspen Technology, Inc. (“AspenTech”). All rights reserved. This work may not be reproduced or distributed in any form or by any means without the prior written consent of AspenTech. ASPENTECH MAKES NO WARRANTY OR REPRESENTATION, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THIS WORK and assumes no liability for any errors or omissions. In no event will AspenTech be liable to you for damages, including any loss of profits, lost savings, or other incidental or consequential damages arising out of the use of the information contained in, or the digital files supplied with or for use with, this work. This work and its contents are provided for educational purposes only.

AspenTech®, aspenONE®, and the Aspen leaf logo, are trademarks of Aspen Technology, Inc.. Brands and product names mentioned in this documentation are trademarks or service marks of their respective companies.