

Introduction to Flowsheeting

Spoken Tutorial Project
<https://spoken-tutorial.org>

National Mission on Education through ICT
<https://sakshat.ac.in>

Script: Prof Kannan Moudgalya
Narration: Kaushik Datta
IIT Bombay

Original: 26 May 2015
Revised: 9 November 2019



Learning Objectives



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In this tutorial, we will learn to:



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In this tutorial, we will learn to:

- **Simulate a mixer**



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- Follow it up with a flash separator



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In this tutorial, we will learn to:

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- Follow it up with a flash separator
- Give a two phase feed



System Requirement



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- **DWSIM v 5.8 (Classic UI) Update 3**



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- DWSIM v 5.8 (Classic UI) Update 3
- Windows 10 OS



System Requirement

- DWSIM v 5.8 (Classic UI) Update 3
- Windows 10 OS
- Any OS: Linux, Mac OS X or FOSSEE OS on ARM



Prerequisites



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- **Introductory exposure to DWSIM**



Prerequisites

- Introductory exposure to DWSIM
- The prerequisite DWSIM tutorials are mentioned on our website
<https://spoken-tutorial.org>



Code Files



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- **flow-begin** file used in the tutorial is provided as a Code file on this tutorial page



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- **flow-begin** file used in the tutorial is provided as a Code file on this tutorial page
- **Download the file from Code Files link**



Contents of flow-begin.dwxml

Thermodynamics: Raoult's law
Units: CGS

	Inlet1	Inlet2
Mole fractions		
Benzene	0.8	0.2
Toluene	0.2	0.8
Molar flow (mol/s)	100	100
T (°C)	25	25
P (atm)	1	1



Summary

- **Simulate a mixer**
- **Follow it up with a flash separator**
- **Give a two phase feed**



Assignment 1: Verify Flow Rates

- Check if the molar flow rate of $\text{Inlet1} + \text{Inlet2} = \text{mixer-out}$, and $\text{Inlet1} + \text{Inlet2} = \text{Vapour} + \text{Liquid}$
- Check if the flow rate of the **Vapour** stream is equal to the flow rate of vapour fraction in **mixer-out**
- Do the same thing for **Liquid**



Assignment 2:

Verify Mole Fractions

- Check if the mole fractions of benzene and toluene in **mixer-out** = that of **Liquid**



Assignment 3: Get rid of mixer

- As the **Separator** has 6 inputs, **Inlet1** and **Inlet2** can directly be connected to two input ports - do this
- Remove the **mixer** and **mixer-out**
- See if you get the same answers



Assignment 4: Energy Stream

- Click on Separator
- Change **Override separation temperature** value to 100° C
- Bring **Energy stream** from **Object Palette** to the Flowsheet
- Connect this stream to the **Separator**
- Simulate and analyse your results



About the Spoken Tutorial Project

- Watch the video available at https://spoken-tutorial.org/What_is_a_Spoken_Tutorial
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Spoken Tutorial Workshops

The Spoken Tutorial Project Team,

- Conducts workshops using spoken tutorials
- Gives certificates to those who pass an online test
- For more details, please write to contact@spoken-tutorial.org



Forum for specific questions

- Do you have questions in this Spoken Tutorial?
- Please visit <https://forums.spoken-tutorial.org>
- Choose the minute and second where you have the question
- Explain your question briefly
- Someone from the FOSSEE team will answer them



DWSIM Flowsheeting Project

- The FOSSEE team coordinates conversion of existing flowsheets
- We give honorarium and certificates for those who do this
- For more details, please visit this site
<https://dwsim.fossee.in/flowsheeting-project>



Lab Migration Project

- The FOSSEE team helps migrate commercial simulator labs to DWSIM
- We give honorarium and certificates for those who do this
- For more details, please visit this site
<https://dwsim.fossee.in/lab-migration-project>



Acknowledgements

- **Spoken Tutorial and FOSSEE projects are funded by MHRD, Government of India**



Thanks

- This tutorial was originally recorded by Prof Kannan Moudgalya in May 2015

