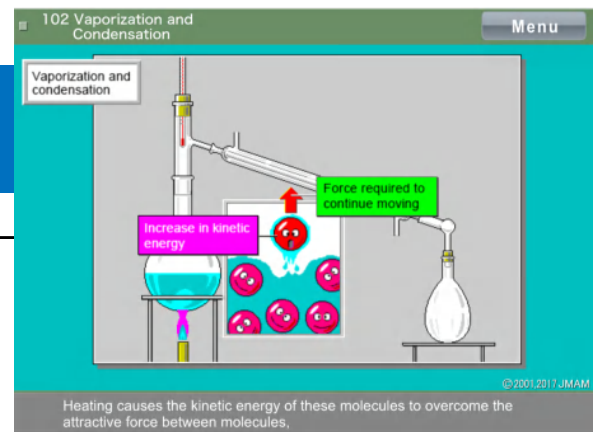


Distillation Basics Course

- To acquire the necessary knowledge to manage the effective operation of distillation columns.



Characteristics

- ★ Principles of distillation, structure and function of distillation columns, theories and calculation methods of distillation, etc. are realistically explained through a combination of computer graphics, narration and video.
- ★ Basic knowledge required understanding distillation, the principles of distillation, and the structure of distillation columns is taught through experiments and actual examples.
- ★ A deep understanding of the number of stages in distillation columns is enabled by introducing methods for calculating the number of stages as well as stage calculation exercises.

Curriculum

- (1) Principles of Distillation
- (2) Structure and Function of Distillation Columns
- (3) Vapor-liquid Equilibrium Curve
- (4) Calculation of the Number of Stages
- (5) Conditions for Optimal Operation
- (6) Stage Calculation Exercises
- (7) Facts on Distillation Techniques

Who should take this course

Plant operators, engineers

Course material outline

- ◆ Expected learning time : 5hours
- ◆ Shortest duration : 149minutes
- ◆ Number of tests : 5

Supervised by

Idemitsu Kosan Co.,Ltd. Technical Training Center

Curriculum

(1) Principles of Distillation

- 101 Purpose of Distillation
- 102 Vaporization and Condensation
- 103 Vapor-liquid Equilibrium
- 104 Vapor Pressure
- 105 Vapor Pressure Curve
- 106 Moles and Mole Fractions
- 107 Raoult's Law
- 108 Light Components and Heavy Components
- 109 t-x, y Diagram
- 110 Summary of the Basic Points of Distillation (1)
- 111 Summary of the Basic Points of Distillation (2)

(2) Structure and Function of Distillation Columns

- 201 Principles of Distillation and Distillation Columns
- 202-1 Mechanism of Distillation Columns - 1
- 202-2 Mechanism of Distillation Columns - 2
- 202-3 Mechanism of Distillation Columns - 3
- 203 Structure and Function of Stages and Trays
- 204 Accessory Equipment of Distillation Columns
- 205 Basic Conditions of Distillation Columns

(3) Vapor-liquid Equilibrium Curve

- 301 Important Factors in Separation by Distillation
- 302 Vapor-liquid Equilibrium Curve
- 303 Relative Volatility
- 304 Average Relative Volatility
- 305-1 Expansion of Raoult's Law - 1
- 305-2 Expansion of Raoult's Law - 2

(4) Calculation of the Number of Stages

- 401 Number of Stages of Distillation Columns
- 402 Minimum Number of Theoretical Stages (Total Reflux)
- 403 Reflux Ratio
- 404-1 Rectification Line and Stripping Line - 1
- 404-2 Rectification Line and Stripping Line - 2
- 405 Minimum Reflux Ratio
- 406 Optimal Reflux Ratio
- 407 Required Number of Theoretical Stages
- 408 Regarding Tower Efficiency

(5) Conditions for Optimal Operation

- 501 Volume of Vapor in the Tower and the Behavior of the Distillation Columns
- 502 Allowable Vapor Speed
- 503 Tray Capacity Diagram

(6) Stage Calculation Exercises

- 601 Overview of Depropanizers
- 602 Calculation of the Boiling Points of Both Components
- 603 Calculation of the Vapor Pressure of Both Components
- 604 Calculation of Relative Volatility and Average Relative Volatility
- 605 Calculation of the Relationship of x-y and Drawing an x-y Diagram
- 606 Calculation of the Minimum Number of Theoretical Stages - 1
- 607 Calculation of the Minimum Number of Theoretical Stages - 2
- 608 Calculation of the Minimum Reflux Ratio
- 609 Calculation of the Required Number of Theoretical Stages and Actual Number of Stages

(7) Facts on Distillation Techniques

- 701 Approach Regarding Energy Conservation
- 702 Progressing to Multi-component Distillation
- 703 Operation of Distillation Columns