Purpose
To acquire the concept of chemical equilibrium, which is the basis of chemical reactions used on an industrial scale, along with catalyst mechanisms and calculation of reactions.

Characteristics
★ You can learn about the information gained from chemical equations and chemical equilibrium, which are essential for handling chemical reactions, via animated computer graphics and video.
★ You can also specifically learn various calculation methods necessary to control reactors by taking actual chemical reactions as examples.

Curriculum
Before You Start Studying
Chapter 1 Perspective on Chemical Reaction Equations
Chapter 2 Actual Chemical Reactions
Chapter 3 Concept of Chemical Equilibrium
Chapter 4 Rate of Reaction
Chapter 5 Temperature Dependence of the Rate of Reaction
Chapter 6 Reaction Mechanisms
Chapter 7 Catalyst Function
Chapter 8 Catalytic Reaction Mechanisms
Chapter 9 Catalytic Reactors
Chapter 10 Summary of Reactions

Who should take this course
Novice and mid-level employees responsible for maintenance work, operators and engineers on production-sites (plants), and workers, supervisors and administrators in the field

Course material outline
◆ Expected learning time: 6 hours    ◆ Number of tests: 3
◆ Shortest duration: 114 minutes

Supervised by
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Chapter 7 Catalyst Function
701 Effect of Catalysts (1)
702 Effect of Catalysts (2)
703 Influence of Catalysts on Chemical Equilibrium
704 Selectivity of Catalysts

Chapter 8 Catalytic Reaction Mechanisms
801 Shape of Catalysts
802 Chemisorption and Physisorption
803 Surface Area of Catalysts
804 Catalytic Reaction Mechanism
805 Aging of Catalysts
806 Poisoning
807 Sintering
808 Mechanical Rupture of Catalysts

Chapter 9 Catalytic Reactors
901 Reaction Conditions and the Structure of Reactors
902 Fixed-bed Reactor (1)
903 Fixed-bed Reactor (2)
904 Space Velocity
905 Pressure Drop in the Catalyst Bed
906 Fluidized-bed Reactor (1)
907 Fluidized-bed Reactor (2)
908 Calculation of Umf and Ut (1)
909 Calculation of Umf and Ut (2)
910 Calculation of Umf and Ut (3)

Chapter 10 Summary of Reactions
1001 Determination of the Reaction Order (1)
1002 Determination of the Reaction Order (2)
1003 Determination of the Reaction Order (3)
1004 Determination of the Reaction Order (4)
1005 Calculation of the Reaction Temperature (1)
1006 Calculation of the Reaction Temperature (2)
1007 Calculation of the Reaction Temperature (3)
1008 Calculation of the Feed Flow Rate (1)
1009 Calculation of the Feed Flow Rate (2)
1010 Calculation of the Feed Flow Rate (3)