

## Workshop program 2023

(초급: Alloy Design)

### February 1 (Wednesday)

9:00-9:20	<b>Registration</b>
9:20	<b>Welcome</b>
9:30	<b>Overview of FactSage and Thermodynamics</b>
10:30	(Coffee)
10:45	<b>FactSage Database overview</b> <b>Data search and simple reaction calculation (View Data, Compounds, Reaction)</b> <ul style="list-style-type: none"><li>- H, S, Cp of compounds</li><li>- Preparing new private database</li><li>- balanced chemical reactions</li><li>- adiabatic reactions, heat cycles</li></ul>
12:15	(LUNCH)
13:30	<b>Equilib-regular</b> <ul style="list-style-type: none"><li>- Transition calculations (solidus, liquidus, phase transformation)</li><li>- Thermodynamic property</li><li>- Scheil cooling calculations</li></ul>
15:30	(Coffee)
15:45	<b>Phase diagram -Regular</b> <ul style="list-style-type: none"><li>- Classical binary phase diagrams</li><li>- Isopleths</li><li>- Ternary and multicomponent phase diagrams</li><li>- Figure module</li></ul>
17:00	<b>END OF DAY 1</b>

### February 2 (Thursday)

9:30	<b>Phase Diagram / Equilib -Intermediate</b> <ul style="list-style-type: none"><li>- Oxidation of metal</li><li>- Interfacial reaction calculation</li></ul>
10:30	(Coffee)
10:45	<b>Phase Diagram / Equilib -Intermediate</b> <ul style="list-style-type: none"><li>- Heat balance</li><li>- Composition target</li><li>- Para-equilibrium</li></ul>
12:15	(LUNCH)
13:30	<b>Case study I: Alloy design</b> <ul style="list-style-type: none"><li>- Zn galvanizing</li><li>- Alloy design</li></ul>
15:00	(Coffee)
15:15	<b>Case study II: Alloy design</b> <ul style="list-style-type: none"><li>- Al/Mg alloy design</li><li>- TTT Diagram (JMAK equation)</li></ul>
17:30	<b>END OF DAY 2</b>

## Workshop program 2023

### (초급: Process design and Pyrometallurgy)

#### February 1 (Wednesday)

9:00-9:20	<b>Registration</b>
9:20	<b>Welcome</b>
9:30	<b>Overview of FactSage and Thermodynamics</b>
10:45	(Coffee)
11:00	<b>FactSage Database overview</b> <b>Data search and simple reaction calculation (View Data, Compounds, Reaction)</b> <ul style="list-style-type: none"><li>- H, S, Cp of compounds</li><li>- Preparing new private database</li><li>- balanced chemical reactions</li><li>- adiabatic reactions, heat cycles</li></ul>
12:30	(LUNCH)
13:30	<b>Equilib-regular</b> <ul style="list-style-type: none"><li>- Transition calculations (solidus, liquidus, phase transformation)</li><li>- Thermodynamic property</li><li>- Scheil cooling calculations</li></ul>
15:30	(Coffee)
15:45	<b>Phase Diagram-regular</b> <ul style="list-style-type: none"><li>- Classical binary phase diagrams</li><li>- Isopleths</li><li>- Ternary and multicomponent phase diagrams</li><li>- Figure module</li></ul>
17:00	<b>END OF DAY 1</b>

#### February 2 (Thursday)

9:30	<b>Equilib-Advance I</b> <ul style="list-style-type: none"><li>- Stream calculations</li><li>- Interface reactions</li><li>- Open calculations</li></ul>
10:45	(Coffee)
11:00	<b>Equilib-advance II</b> <ul style="list-style-type: none"><li>- Viscosity</li><li>- Metal/gas reaction - oxidation</li></ul>
12:30	(LUNCH)
13:30	<b>Equilib-advance III</b> <ul style="list-style-type: none"><li>- Refining: slag/metal/gas reaction</li><li>- Inclusions evolution</li></ul>
15:00	(Coffee)
15:15	<b>Case study I: Pyrometallurgical processing</b> Steelmaking calculations Cu smelting process
17:30	<b>END OF DAY 2</b>

## Workshop program 2023

(중급)

### February 1 (Wednesday)

9:00-9:20	<b>Registration</b>
9:20	<b>Welcome</b>
9:30	<b>Overview of FactSage and Thermodynamics</b>
10:45	(Coffee)
11:00	<b>FactSage Database and Private database</b> - Databases - Generation of Private database
12:15	(LUNCH)
13:30	<b>Case study 1</b> - Alloy design: Steel, Mg, Al, etc.
15:30	(Coffee)
15:45	<b>Case study 2</b> - Process Analysis: EAF, Steelmaking, etc. - Process design: Li batter / waste recycling
17:00	<b>END OF DAY 1</b>

### February 2 (Thursday)

9:30	<b>Case study 3</b> - PyProSim: new process simulation tool
10:45	(Coffee)
11:00	<b>Case study 4</b> - Process design: F gas removal by liquid metal treatment - SMR nuclear salt design
12:30	(LUNCH)
13:30	<b>Case study 5</b> - new ceramic materials design for CO <sub>2</sub> and H <sub>2</sub> O splitting - new aerospace ceramic materials design for extreme condition
15:00	(Coffee)
15:15	<b>Case study 6</b> - Others
17:30	<b>END OF DAY 2</b>

**Workshop program 2023**  
**Case study examples by all participants**

**February 3 (Friday)**

9:30	<b>Case study (I)</b> - examples by participants
10:40	(Coffee)
11:00	<b>Case study (II)</b> - examples by participants
12:30	(LUNCH)
13:30	<b>Case study (III)</b> - examples by participants
15:00	<b>END OF DAY 3</b>