



Aalto University

CHEM-E6105

Thermodynamics of solutions

Introduction

Spring 2019

General

- **Course personnel**
 - Prof. Daniel Lindberg
 - Senior lecturer Jari Aromaa (tutorials and workshops)

Contents

Thermodynamics of solution phases and their analytical forms in condensed systems,

Use and development of analytical (Gibbs energy) descriptions for solution phases

Applications of Gibbs energy minimisation techniques for chemical process simulations.

Course material: D. Gaskell, Introduction to the thermodynamics of materials, 4. Ed., Taylor & Francis, 2003, UK.

Learning outcomes

After the course the student can

- understand the structure of a thermochemical solver (i.e. a Gibbs energy minimiser).
- handle equilibria in heterogeneous multi-component (non-ideal) systems.
- do equilibrium simulations in multi-component heterogeneous systems.

General - workload

- **Course is composed of lectures, tutorials and project work**
- **Lectures 12 h,**
 - Tuesdays 8-10 in Ke3, 8.1, 15.1, 22.1, 29.1, 5.2, **12.2**
- **Tutorials 24 h**
 - Wednesdays 8-10 & Thursdays 12-14
- **Project (home) work 37 h**
 - Three separate tasks to be completed in 2-person teams; deadline in IV period (to be announced later)
- **Independent (group) studies 62 h**

Course evaluation

Examination (50%)

Project work (á 16.667%=3x16.667%=50%)

All must be 'passed'.

Course exam 12.4.2019

Skills needed

- **General chemical thermodynamics, inorganic and physical chemistry form the key disciplines and they are the necessary background of the course.**

Course information

- **Mainly through myCourse portal and in lectures as well as tutorials**
- **Group e-mails from WebOodi will be used if necessary**
- **Exam and workshop marks will also be posted on the 'TDM-group' board (Chemical Engineering building, F-wing, IV floor) if needed**

Study materials

- **The lecture hand-outs will be available as pdf files in myCourses**
- **Textbook: D.R. Gaskell, Introduction to the Thermodynamics of Materials (4th or 5th edition); available to you as e-book in the Aalto library**
- **Written docs in tutorials**