Notes on the module handbook of the department Mechanical and Process Engineering

Die hier dargestellten veröffentlichten Studiengang-, Modul- und Kursdaten des Fachbereichs Maschinenbau und Verfahrenstechnik ersetzen die Modulbeschreibungen im KIS und wuden mit Ausnahme folgender Studiengänge am 28.10.2020 verabschiedet.

Ausnahmen:

- BSc. Bio- und Chemieingenieurwissenschaften (Stand WS 20/21): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_BSc_BCI.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_BSc_BCI.pdf)
- BEd. Lehramt Metalltechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Bachelor_Lehramt_Metalltechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Bachelor_Lehramt_Metalltechnik.pdf)
- MSc. Bio- und Chemieingenieurwissenschaften (Stand WS 20/21): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_Msc_BCI.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MH_Msc_BCI.pdf)
- MEd. Lehramt Metalltechnik Werkstoffe und Fertigung (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Werkstoffe_und_Fertigung.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Werkstoffe_und_Fertigung.pdf)
- MEd. Lehramt Metalltechnik Maschinen- und Fahrzeugtechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Fahrzeugtechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Fahrzeugtechnik.pdf)
- MEd. Lehramt Metalltechnik Verfahrenstechnik (Stand WS 19/20): https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Verfahrenstechnik.pdf (https://www.mv.uni-kl.de/fileadmin/mv/Studium_Lehre/Modulhandbuecher/MHB_Master_Lehramt_Metalltechnik_-_Verfahrenstechnik.pdf)

Module MV-TD-M172-M-4

Thermodynamics of electrolyte solutions (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
MV-TD-M172-M-4	*Thermodynamics of electrolyte solutions*	3.0 CP (90 h)

Basedata

CP, Effort	3.0 CP = 90 h
Position of the semester	1 Sem. in WiSe
Level	[4] Bachelor (Specialization)
Language	[DE] German
Module Manager	Hasse, Hans, Prof. Dr.-Ing. (PROF | DEPT: MV) (/staff/314/) Kohns, Maximilian, Jun.-Prof. Dr.-Ing. (PROF | DEPT: MV) (/staff/291/)
Lecturers	Kohns, Maximilian, Jun.-Prof. Dr.-Ing. (PROF | DEPT: MV) (/staff/291/)
Area of study	[MV-LTD] Engineering Thermodynamics
Livecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2V	**MV-TD-86079-K-4** (/mhb/courses/MV-TD-86079-K-4/)	P	-	PL1	3.0	WiSe

- About **[MV-TD-86079-K-4]**: Title: "Thermodynamics of electrolyte solutions"; Presence-Time: 28 h; Self-Study: 62 h

Examination achievement PL1

- Form of examination: **oral examination (15-30 Min.)**
- Examination Frequency: each semester
- Examination number: 10183 ("Thermodynamics of electrolyte solutions")

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [MV-TD-86079-K-4] Thermodynamics of electrolyte solutions (/mhb/courses/MV-TD-86079-K-4/)**:**

- Fundamentals of chemical thermodynamics
- Electrolytes, dissociation, pH
- Electrolyte solutions, chemical potentials and activities
- Activity coefficient models for electrolyte solutions
- Electrochemical potential and phase equilibrium
- Electrochemical cells
- Applications (batteries, fuel cells, electrolysis)

Competencies / intended learning achievements

From [MV-TD-86079-K-4] Thermodynamics of electrolyte solutions (/mhb/courses/MV-TD-86079-K-4/)**:**

1. Lecture:

Students will be able to

- describe the thermodynamics of electrolyte solutions and the corresponding model approaches

- model thermodynamic properties of electrolyte solutions independently and choose the appropriate model depth in a reasonable way

2. Practice:

Students will be able to

- independently apply the methods covered in the lecture
- apply models of thermodynamic properties of electrolyte solutions to solve problems and determine the necessary parameters for this purpose

Literature

From [MV-TD-86079-K-4] Thermodynamics of electrolyte solutions (/mhb/courses/MV-TD-86079-K-4/)**:**

- K. S. Pitzer: Activity Coefficients in Electrolyte Solutions, CRC Press, 1991.
- J. F. Zemaitis Jr.: Handbook of Aqueous Electrolyte Solutions, New York, Design Institute for Physical Property Data, 1986.
- G. Wedler: Lehrbuch der Physikalischen Chemie, 4. völlig überarbeitete und erweiterte Auflage, Wiley-VCH, Weinheim, 1997.
- R. A. Robinson, R. H. Stokes: Electrolyte Solutions, 2nd rev. ed., Dover Publications, Mineola, NY, 2002.

Requirements for attendance (informal)

Modules:

- [MV-TD-56-M-4] Thermodynamics of Mixtures (M, 5.0 LP) (/mhb/modules/MV-TD-56-M-4/)

Requirements for attendance (formal)

None

References to Module / Module Number [MV-TD-M172-M-4]

Course of Study	Section	Choice/Obligation
[MV-88.A29-SG] M.Sc. Biological and Chemical Engineering (/mhb/FB-MV/cos-567/)	Studienschwerpunkt II	[WP] Compulsory Elective

Module-Pool	Name
[MV-ALL-MPOOL-6 (/mhb/modulepools/MV-ALL-MPOOL-6/)]	Wahlpflichtmodule allgemein
[MV-BioVT-MPOOL-6 (/mhb/modulepools/MV-BioVT-MPOOL-6/)]	Wahlpflichtmodule Bioverfahrenstechnik
[MV-CE-MPOOL-6 (/mhb/modulepools/MV-CE-MPOOL-6/)]	Wahlpflichtmodule Computational Engineering
[MV-EVT-MPOOL-6 (/mhb/modulepools/MV-EVT-MPOOL-6/)]	Wahlplichtmodule Energie- und Verfahrenstechnik