

In-depth Practical					
Module number	Credits	Workload	Term	Frequency	Duration
	8 CP	240 h	1. Sem.	only WS	1 Semester
Courses Characterization of Heterogeneous Catalysts			Contact hours a) 8 SWS b) 1 SWS	Self-Study 105 h	Group size Max. 12 participants
Prerequisites Solid knowledge of basics in <i>Heterogeneous Catalysis</i> , <i>Chemical Reaction Engineering</i> , <i>Physical Chemistry</i> , and in <i>Industrial Chemistry</i>					
Learning/Course Objectives: Practical experience with important characterization techniques for heterogeneous catalysts, the related data treatment methods and approaches to data interpretation, critical assessment of the potential of the techniques, the accuracy of the data and the significance of the results for catalyst research, training in reporting, presentation and public discussion of the results.					
Content Practical experiments using <ul style="list-style-type: none"> • nitrogen physisorption, • thermogravimetry, • X-ray photoelectron spectroscopy, • FTIR spectroscopy, • Raman spectroscopy, • UV-Vis spectroscopy, • X-ray diffraction, and virtual experiments (treatment of measured data only) in <ul style="list-style-type: none"> • X-ray absorption spectroscopy • and other methods are offered. 4 selected experiments are performed by groups of 2 students.					
Teaching methods a) Practical; b) Seminar					
Mode of assessment 50 min end-of-term presentation of the results including discussion					
Requirement for the award of credit points Successful experimental performance, 4 accepted protocols, and successful oral presentation					
Module applicability Master of Chemistry, focal point Industrial Chemistry					
Weight of the mark for the final score Weighted according to CPs					
Module coordinator and lecturer(s) B. Mei, M. Muhler					
Further information All required documents incl. safety instructions are distributed via <i>moodle</i> .					