

SCIENTIFIC AND METHOD MODULES

Module name	Synthesis – Preparative Methods in Chemistry		
Number	2011-M08		
Aims	 Getting familiar with synthesis methods in solid state chemistry Synthesis of new materials via molecular precursors, chemical transport, sol gel processes and solvothermal reactions Understanding and application of the different methods to prepare complex systems and nanomaterials. 		
Basics	The basics of this topic are covered by lectures in chemistry from existing bachelor or master courses: Principles of chemical reactions; solid state reactions; solubility and crystallization		
Contents	 Synthesis of solid state compounds and nanomaterials; understanding the chemical aspects of preparative methods 1. Introduction: reactions in solid state 2. Materials synthesis and functional properties 3. Sol-gel methods 4. Nanostructured metals, oxides, carbon and their hybrids 5. High temperature species in synthesis 6. Hydrothermal/Solvothermal synthesis 7. Templated synthesis 8. Chemical Transport reactions 		
Methods	Introducing the synthetic tools for solid state and nano materials, a selection of typical methods in preparative solid state chemistry is presented. Preparation and characterization of nanomaterials.		
Туре	Two-day block course/ yearly recurrence with modification		
Date (month/year)	July 7 - 8, 2011		
Time	9:00 – 18:00		
Work load	15 hours presence/ 45 hours self-study		
Examination	oral		
Credit points	2		
Responsible scientists	Krautscheid, Kersting		
International guest lecturers	Prof. Dr. N. Hüsing, Universität Salzburg Prof. Dr. P. Schmidt, HS Lausitz Prof. Dr. J. J. Schneider, TU Darmstadt		
Recommendations for literature, e- learning	 E. Smart, L. Moore: "Solid State Chemistry: An Introduction", CRC Press, 3. ed., 2005 U. Schubert, N. Hüsing: "Synthesis of Inorganic Materials", VCH M. Binnewies, R. Glaum, M. Schmidt, P. Schmidt: "Chemische Transport- Reaktionen", de Gruyter, 2011 		

SCHEDULE 2011

Time	Lecturer	Programme	Location	
Day 1: Thursday, July 7, 2011				
09:00 - 09:10	H. Krautscheid,	Welcome	Johannisallee 29	
	Universität Leipzig		SR 101	
09:10 - 10:30	H. Krautscheid	Solid State synthesis - general aspects	SR 101	
Coffee break and discussions				
11:00 - 12:30	Prof. Dr. N. Hüsing,	Synthesis of Inorganic Materials by Sol-Gel	SR 101	
	Universität Salzburg	Methods		
Lunch break				
13:15	Departure (tram 16) to	photo shooting	Augustusplatz	
14:00 - 15:30	Prof. Dr. J. Schneider,	Materials synthesis and functional properties of	SR 101	
	TU Darmstadt	nanostructured metals, oxides, carbon and their		
		hybrids		
		Coffee break and discussions		
16:00 - 17:00	Discussion		SR 101	
18:30	Dinner: Auerbachs Keller			
Day 2: Friday, July 8, 2011				
09:00 - 10:30	Prof. Dr. B. Kersting,	Templates in synthesis of materials	SR 101	
	Universität Leipzig			
Coffee break and discussions				
11:00 - 12:30	Prof. Dr. P. Schmidt,	Synthesis by Chemical Vapour Transport	SR 101	
	HS Lausitz			
		Lunch break		
13:45	Departure (tram 2) to B			
14:00 - 15:00	Cultural programme: Bi	Beethovenstraße		
16:00	Oral exams			

Didactic elements:

Lectures and discussions

Expected performance: Active participation in discussions