

Physical electrochemistry and electrocatalysis

2019

Start: 19/02/2019
 Duration: 3h
 Exercise: 45 min
 Exercise hand-outs 1 week in advance
 Korrekctions: 2 PhDs

Lecture	Date	Topics				Lecturer	Exercise demonstrations				Comment
		1	2	3	4		Derivation	Understanding Reasoning	Numerical Real values	Industrial app	
1	19/02/2019	Nernst	Conductivity	Daniel element	Copper deposition	Schmidt	E0	Conductivity (electronic vs ionic)			
2	26/02/2019	Eq.+Kinetics	Galv. & Volta potential	Double layer		Schmidt	E1	Deriv. Nernst	Definitions	Potentials	
3	05/03/2019		Transition State Theory	Butler-Volmer		Schmidt	E2	Double-layer capacitors			
4	12/03/2019		Tafel slope	Multistep electrode reactions		Schmidt	E3	Nernst-Butler-Vol-Tafel		H2O electrolysis	
5	19/03/2019		Details on Multistep			Schmidt	E4	MS-ER			
6	26/03/2019		OER	CIER	HER	Schmidt	E5	HER	ORR		
7	02/04/2019		Mass	Adsorption	CO oxidation		Saveleva	E6	Adsorption, Surface coverage, Langmuir, Frumkin		
8	09/04/2019	Mass transfer				Schmidt	E7	Mass Transfer	Tafel corrected for Mass transfer		
9	16/04/2019	Theo	Quantum electrochemistry			Perego	E8	Def. + Symb.	Derivation of potentials		
10	30/04/2019		Marcus theory			Perego	E9	Marcus theory	Inverted region		
11	07/05/2019	Method	CV	Impedance		Saveleva	E10	Voltamm.	EIS		
12	14/05/2019		RDE			Saveleva	E11	RDE	Voltamm.	UPD	
13	21/05/2019	Final	Electrocatalysis	Vulcano plots		Schmidt	E12	Electrocatalysis and Vulcano			
14	28/05/2019		Wrap up	Electrochemistry slam		Saveleva	E13				

Electrochemistry Slam

RDE
 Impedance
 CV
 Adsorption
 Mass Transport
 Marcus Theory
 Butler Volmer
 Tafel
 Double Layer
 Nernst
 Potentials (Volta etc)
 Activation Energy
 Reaction Orders