CHEMISTRY OF MATERIALS FOR ELECTRIC ENERGY CONVERSION AND STORAGE

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Basics of electrochemistry in respect to electrodics and ionics of chemical power sources. Equilibrium thermodynamics at electrode/electrolyte interfaces. Models for electrode (Me, semiconductor) - electrolyte interface. Electrode kinetics. The role of adsorption in electrode processes. Electrocatalysis.

Similarities and differences between “solid state” and “liquid” electrochemistry. Nonaqueous chemistry for filling a gap in power / energy spectrum. Materials for high power rechargeable batteries. Insertion materials: graphite, nanocarbons, titania nanoparticles, nano-silica, alloys, transition metal oxides and sulfides as intercalation materials.

Synthesis and properties of solid polymer electrolytes, gel type electrolytes and liquid electrolytes for electrochemical cells.

Electrochemical capacitors (EC): pseudocapacitors and double layer capacitors EDLC. The role of pseudocapacitance for energy storage. Electrodes: inorganic oxides electrodes (MeO_x), conducting polymers (p-type and n-type systems). Electroactive organic / inorganic materials. Interfacial properties in aqueous and nonaqueous electrolytes. Symmetric and asymmetric devices.

Photoelectrocatalysis – current trends in semiconductors’ chemistry in respect to photoanode and photocathode applications.

date	**Week day**	**time**	**Place** Provisional information may be changed
16.05.2016	**poniedziałek**	**9:15-12**	**400A GG**
17.05.2016	**wtorek**	**9:15-12**	**112/113 Chemia A**
18.05.2016	**Środa**	**9:15-12**	**112/113 Chemia A**
19.05.2016	**czwartek**	**9:15- 12**	**400A GG**
20.05.2016	**piątek**	**9:15-12**	**400A GG**