



4. GÖCH-Symposium 2014 „Physikalische Chemie in Österreich“



28.-29. April 2014
Lehrstuhl für Physikalische Chemie
Montanuniversität Leoben

Abstracts

Organisationskomitee

Werner Sitte, Wolfgang Kautek, Liane Hackl, Dietmar Große-Eschedor, Peter Gsaxner, Nina Schrödl, Karin Stanglauer

Montag, 28.04.2012

12:00 - 14:00

Registrierung

Sitzungszimmer
1. Stock

Begrüßung

14:00 - 14:10

Wolfgang KAUTEK Vorsitzender GÖCH Arbeitsgruppe Physikalische Chemie
Werner SITTE Lehrstuhl Physikalische Chemie, Gastgeber

Session 1 Vorsitz Erminald BERTEL

14:10 - 14:30	Modelling Solid Oxide Fuel Cell (SOFC) Anodes by Surface Science Methods: Ni-ZrO ₂ -Pt ₃ Zr	Günther RUPPRECHTER TU Wien
14:30 - 14:50	Electrochemical properties of La _{0.6} Sr _{0.4} FeO _{3-δ} thin film electrodes under oxidizing and reducing conditions	Sandra KOGLER TU Wien
14:50 - 15:10	Anode development for high temperature electrolysis cells (SOECs)	Andreas EGGER MU Leoben

15:10 - 17:00

Poster

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Session 2 Vorsitz Jürgen FLEIG

17:00 - 17:20	Defect Pairs Catalysing Phase Transitions	Erminald BERTEL Univ. Innsbruck
17:20 - 17:40	Combinatorial Investigation of the Effects of Incorporation of Fe, Ni and Co on the Performance of WO ₃ photoelectrodes	Achim Walter HASSEL Universität Linz
17:40 - 18:00	Dynamic ESR-spectroscopy in ionic liquids: A new class of solvents	Günter GRAMPP TU Graz

Anschließend Gelegenheit zur Führung durch den Lehrstuhl für Physikalische Chemie, Montanuniversität Leoben

19:30

Gemeinsames Abendessen im Gasthof "Weinlaube Schwarzer Hund" Hauptplatz

Dienstag, 29.04.2014

Session 3 Vorsitz Wolfgang KAUTEK

09:00 - 09:20	Anodic oxides on Hf-based thin film combinatorial libraries	Andrei Ionut MARDARE Universität Linz
09:20 - 09:40	Photoelectrochemical characterization of sub-micro-gram amounts of organic semiconductors using scanning droplet cell microscopy	J.P. KOLLENDER Universität Linz
09:40 - 10:00	Study on the solidification behaviour of a hyper-eutectic Cu-Sn alloy	Cezarina Cela MARDARE Universität Linz

10:00 – 10:40	Poster	Sitzungszimmer 1. Stock
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Session 4 Vorsitz Günther RUPPRECHTER

10:40 - 11:00	Ionic and electronic transport properties of electroceramic materials involving grain boundaries	Wolfgang PREIS MU Leoben
11:00 – 11:20	Charge transport properties of Fe-doped SrTiO ₃ thin films upon DC voltage	Stefanie HUBER TU Wien
11:20 - 11:40	Femtosecond pulse laser irradiation area dependence of the ablation behaviour of silicon	Aida NAGHILOU Universität Wien
11:40 - 12:00	Depth Profiling of Galvano-Aluminium-Nickel Coatings on Steel by UV and VIS Laser-Induced Breakdown Spectroscopy	Tristan O. NAGY Universität Wien

12:00	Schlussworte
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12:15	Mittagessen in der Mensa
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Charge transport properties of Fe-doped SrTiO₃ thin films upon DC voltage

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SrTiO₃ thin films are known to exhibit charge transport properties that differ from those of bulk material [1]. Moreover, they show pronounced resistance changes upon bias voltage [2]. Both phenomena are still only partly understood and are most probably caused by a non-trivial interplay of mixed conduction and interfaces in SrTiO₃ thin films. The scope of this study was to get a clearer picture of the processes caused by migrating charge carriers in thin layers under DC voltage.

The investigated thin Fe-doped SrTiO₃ films were deposited on Nb-doped SrTiO₃ by pulsed laser deposition. In order to permit an electrochemical characterization, microstructured La_{0.6}Sr_{0.4}CoO_{3-δ} (LSC) top electrodes were used. Impedance measurements were performed in a temperature range from 350°C to 700°C with an applied bias up to a few 100mV.

Measurements without applied bias revealed a strong decrease in the conductivity of the SrTiO₃ layers compared to data for bulk samples. Under applied bias the conductivity further changed with a strong dependence on polarity (cf. Wagner-Hebb polarization). Moreover an additional, partly inductive impedance contribution could be observed at low frequencies.

Corresponding current-voltage measurements showed a strong dependence of the curves on the measuring rate. Correlation of both measurement modes allows detailed analysis of defect chemical changes and transport properties of polarized SrTiO₃ thin films.

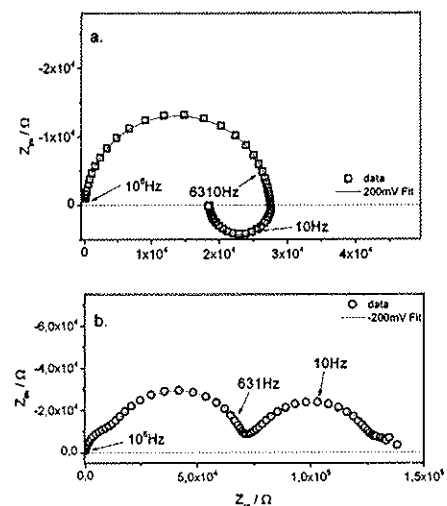


Fig.1. Impedance plots monitored for 200 mV (a) and -200 mV (b) bias voltage

- [1] C. Ohly et.al., J.Europ.Ceram.Soc., 2001, 21,1673-1676
[2] R. Muenstermann et.al., Adv.Mater. 2010, 22, 4819-4822