

15th INTERNATIONAL WORKSHOP ON NANOSCIENCE & NANOTECHNOLOGY

ORGANIZERS:

The National Coordination Council on Nanotechnology
Bulgarian Academy of Sciences

Technical University – Sofia
Sofia Tech Park
Bruker
AQUACHIM JSCo



АКВАХИМ
AQUACHIM



November 21-23, 2013
BAS & Technical University-Sofia

Sofia, Bulgaria

Topic	C – Thin films, superlayers, quantum dots and nanowires. C1-C16
C1	Mikhail Leonov, I.D. Rukhlenko, Yu. K. Gun'ko, A.V. Fedorov, A.V. Baranov TRANSIENT PHOTOLUMINESCENCE FROM SEMICONDUCTOR NANOPLATES m.yu.leonov@gmail.com
C2	Sasho Stojkovikj, Violeta Koleva, Metodija Najdoski CHEMICAL DEPOSITION OF NANO-SIZED ELECTROCHROMIC THIN FILMS OF Na _{0.33} V ₂ O ₅ ·H ₂ O XEROGELS sasostojkovik@yahoo.com
C3	Sasho Stojkovikj, Violeta Koleva, Metodija Najdoski INFLUENCE OF THERMAL TREATMENT ON THE ELECTROCHROMIC PROPERTIES OF SODIUM INTERCALATED VANADIUM(V) OXIDE XEROGEL THIN FILMS sasostojkovik@yahoo.com
C4	Aksu Samet, Violeta Koleva, Metodija Najdoski A NEW CHEMICAL BATH DEPOSITION METHOD FOR PREPARATION OF ELECTROCHROMIC NANO-SIZED AMMONIUM INTERCALATED VANADIUM(V) OXIDE XEROGELS aksusamet09@gmail.com
C5	Aksu Samet, Violeta Koleva, Julijana Velevska, Metodija Najdoski EFFECT OF ELECTROLYTE ON THE ELECTROCHROMISM OF NANOSTRUCTURED THIN FILMS OF AMMONIUM INTERCALATED VANADIUM(V) OXIDE XEROGELS aksusamet09@gmail.com
C6	T. Ivanova, A. Harizanova, Anna Petrova Morphological and optical investigation of sol-gel ZnO films ani@phys.bas.bg
C7	A. Bankova, S. Andreev, K. Raykov, M. Mitov, V. Videkov, B.Tzaneva, E. Dimitrova Growth of thin films of nanostructured oxide on dielectric base

CHEMICAL DEPOSITION OF NANO-SIZED ELECTROCHROMIC THIN FILMS OF Na_{0.33}V₂O₅·H₂O XEROGELS

Sasho Stojkovikj¹, Violeta Koleva², Metodija Najdoski¹

¹ Institute of Chemistry, Faculty of Natural Sciences and Mathematics, Sts. Cyril and Methodius University, Arhimedova 3, PO Box 162, 1000 Skopje, Republic of Macedonia

² Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, 1113 Sofia, Bulgaria

Electrochromic sodium intercalated vanadium(V) oxide xerogels thin films with composition Na_{0.33}V₂O₅·H₂O have been deposited on electroconductive FTO glass substrates by a simple chemical bath method. The deposition of the homogenous thin films is performed at temperature of 85 °C from an aqueous solution containing sodium metavanadate and diethyl sulfate. The xerogel formation is based on the acidification of the metavanadate solution as a result of the hydrolysis process of (C₂H₅)₂SO₄. Thin films with thickness of about 110 nm are prepared for a deposition time of 10 min. The composition, structure and morphology of the films are studied by XRD, IR spectroscopy, TG-DTA and SEM. SEM observations evidence that the film surface is well covered from ribbon-like units composed of nano-particles with dimensions between 50 and 100 nm. The cyclic voltammetry curves display stable redox pairs related to the transitions between V(V) and V(IV) sites which give rise to colour changes: yellow/green/blue. UV-VIS spectra are examined in two electrolytes. Better results regarding the transmittance variance are obtained using LiClO₄ in propylene carbonate as the best value achieved is 37 % at 900 nm.