# 16th INTERNATIONAL WORKSHOP ON NANOSCIENCE & NANOTECHNOLOGY

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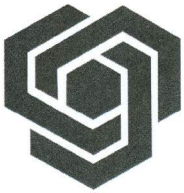


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## Session C – Thin films, superlayers, quantum dots and nanowires

# ELECTROCHROMISM IN LAYERED VANADIUM-BASED THIN FILMS

V. Koleva[1], S. Stojkovikj[2], M. Najdoski[2]
[1] Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences
[2] Institute of Chemistry, Faculty of Natural Sciences and Mathematics, Sts. Cyril and Methodius University, Skopje, Macedonia

Vanadium(V) oxide-based materials have the potential to broaden the color palette displayed by inorganic electrochromics, and thus to extend the range of their functions. The present contribution is focused on the electrochromic properties of thin films with compositions Na0.33V2O5•nH2O (n = 1 and 1.3) prepared by chemical bath deposition method. The film composition and structure as well as the changes occurring during the film storage are studied by XRD, IR spectroscopy and TG-DTA analyses. Na0.33V2O5•nH2O xerogels adopt a layered structure with V2O5 layers and interstitial water molecules and sodium ions. As evidenced by SEM and AFM data the thin films morphology comprises both well separated nanograins with dimensions of 50-200 nm and long ribbon-like units with width of 100-300 nm and length up to several micrometers. The electrochemical and electrochromic behavior of the thin films with different thicknesses between 70 and 300 nm are examined by cyclic voltammetry and UV-Vis spectroscopy. The thin films exhibit two-step electrochromism (yellow-green-blue) with high values of the transmittance variance ($\Delta T$) at 900 nm between 37 and 55 % depending on the film thickness. It is essential that the $\Delta T$ values are retained during the prolonged films storage which is important from practical point of view.