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Structural, optical, and electrochromic properties of V_2O_5 thin films by Metalorganic Decomposition M.B. SAHANA, G. LAWES, K. R. PADMANABHAN, R. NAIK, Wayne State University, Detroit,, V.M NAIK, University of Michigan, Dearborn — V_2O_5 a n-type semiconductor has been widely used in variety of technological applications such as solid state battery cathodes, solar cell windows, and electrochromic devices as it allows easy intercalation/deintercalation of different ions due its open layered structure. Recently the attention has been focused on the development of thin films of V_2O_5 as a cathode material in microbatteries owing to the miniaturization of electronic devices. We report the preparation of V_2O_5 thin films by cost effective easy method of metalorganic decomposition technique using vanadium naphthenate oxide precursor. The solution is spin coated on glass and ITO coated glass substrates. The resulting films on annealing at $450\,^\circ$C are comprised of V_2O_5 nanoparticles as evidenced from X-ray diffraction and Raman spectra. UV-VIS studies indicate band gap of ≈ 2.4 eV. The dependence of electrochromic properties of these films, heat treated at various temperatures, on microstructure and crystallinity will be presented.

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