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Growth of vanadium dioxide thin films using magnetron sputtering FANGFANG SONG, B.E. WHITE, Binghamton University — The unique electronic properties of vanadium dioxide have been a focus of intense experimental and theoretical investigation. Although the origin of the metal-insulator transition in this material is still under investigation, the magnitude of the resistivity change at the metal-insulator transition and closeness of the transition temperature to room temperature suggest this material has high potential for future electronic devices. However, the existence of a large number of distinct stable vanadium oxide phases offers a particular challenge to the growth of thin films of this material. In this work, we present our experimental investigation of vanadium dioxide thin film deposition. RF and DC Magnetron sputtering are used for thin film deposition and the effect of oxygen partial pressure, substrate material, and deposition temperature are studied. The impact of deposition conditions on the structural and morphological properties of the thin films, as determined by x-ray diffraction and scanning electron microscopy, will be discussed. Results indicate that on the technologically relevant silicon dioxide surface, the transitional phase of vanadium dioxide can be stabilized with an appropriate post deposition anneal.

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