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The Effect of Doping on the Metal-Semiconductor Transition in VO₂ SALINPORN KITTIWATANAKUL, STUART WOLF, Department of Physics, University of Virginia, JIWEI LU, Department of Materials Science and Engineering, University of Virginia — Vanadium dioxide (VO₂) is a well-known correlated material that exhibits a metal-semiconductor transition at 340K, with several orders of magnitude change in the resistivity. In this study, we report the effect of Mn-doping and Al-doping, with different doping recipes; the films were deposited by Reactive Biased Target Ion Beam Deposition, and their single phase was confirmed by X-ray diffractometry. The different doping recipes had a very dramatic impact on the crystallinity of the vanadium dioxide films. It was found that using a lower frequency for the pulsed dc target bias was desirable for the improvement of the film quality. Both Al and Mn doping can enhance the transition; while the Al doped VO₂ also raises the transition temperature.

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