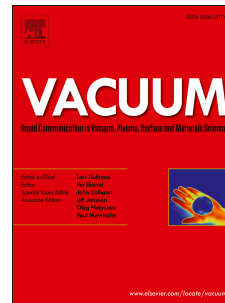


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The durability study of thermochromic vanadium dioxide films with the addition of barrier coatings

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Abstract

The high-performance thermochromic vanadium dioxide (VO₂) films can be applied in many industrial applications such as smart windows, infrared sensors, and infrared imaging (bolometers). The preservation of its highly thermochromic properties of VO₂ films is crucial since the oxidation number of vanadium ranges from +2 to +5 under various reducing or oxidizing atmospheres at elevated temperatures and humid environment. In this study, VO₂ films were fabricated by thermal oxidation of co-sputtered thin films of vanadium and stainless-steel (SS), followed by the addition of barrier coatings on top of the as-prepared VO₂ films for the improvement of long-term stability. The samples with barrier coatings containing zinc oxide (ZnO) and silicon oxide (SiO₂) showed significantly better durability in either wet or dry high

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