

An Investigation of the Effects of Isothermal Exposure on Microstructural Evolution and Oxidation in a Thermal Barrier Coating

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This paper presents the results of a systematic investigation of the effects of isothermal exposure on the microstructural evolution and the isothermal oxidation behavior of a thermal barrier coating with a platinum aluminide bond coat. Sintering of the columnar partially stabilized zirconia is shown to occur during isothermal exposure at 1150°C for durations up to 200 hours. This is accompanied by roughening of the TGO layers, the formation of hemi-spheroidal defects, parabolic coarsening of the TGO and final pull-out of the zirconia layers. The implications of the results are discussed for the analysis and design of TBCs for aeroengine applications.