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# Hot corrosion studies on plasma sprayed bi-layered YSZ/$La_2Ce_2O_7$ thermal barrier coating fabricated from synthesized powders

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## Abstract

$La_2Ce_2O_7$ (LCO) with a pyrochlore structure has been considered as a propitious thermal barrier coating (TBC) system possessing high temperature (>1200 ºC) phase stability. In the present study, double ceramic layer of yttria stabilized zirconia (YSZ) and lanthanum cerium oxide ($La_2Ce_2O_7$, LCO) TBCs are fabricated by atmospheric plasma spraying (APS). Individual LCO and 8YSZ and bilayered LCO/YSZ coatings are developed using flowable YSZ and LCO powders synthesized by co-precipitation and combustion routes respectively and are characterized for phase and microstructure. The coatings subjected to hot corrosion ($Na_2SO_4$+$V_2O_5$ salt at 910 $^{\circ}$C for 30 h) are characterized by X-ray Diffractometry and Scanning Electron Microscopy and Energy Dispersive X-Ray Spectroscopy. XRD shows the phase transformation of YSZ from tetragonal to monoclinic zirconia accompanied by the formation of $LaVO_4$ and $YVO_4$ as hot corrosion products. Considerable decrease in volume fraction of monoclinic zirconia phase has been observed for bilayered LCO/YSZ coating compared to 8YSZ single layer.

**Key Words:** Thermal Barrier Coating (TBC); Bilayer; Atmospheric Plasma Spraying (APS); Hot Corrosion; Microstructure

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