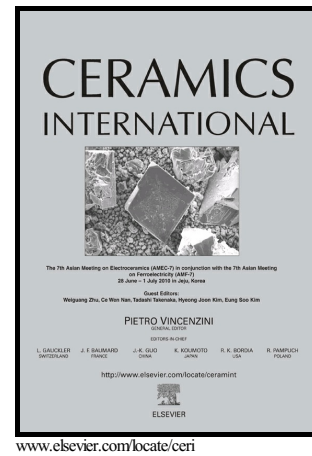


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Structural characterization of YSZ/Al₂O₃ nanostructured composite coating fabricated by electrophoretic deposition and reaction bonding

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Abstract

Suspension of YSZ and Al particles in acetone in presence of 1.2 g/l iodine as dispersant was used for electrophoretic deposition of green form YSZ/Al coating. Results revealed that applied voltage of 6 V and deposition time of 3 min were appropriate for deposition of green composite form coating. After deposition, a nanostructured dense YSZ/Al₂O₃ composite coating was fabricated by oxidation of Al particles at 600 °C for 2 h and subsequently sintering heat treatment at 1000 °C for 2 h. Melting and oxidation of Al particles in the green form composite coating not only caused reaction bonding between the particles but also lowered the sintering temperature of the ceramic coating about 200 °C. The EDS maps confirmed that the composition of fabricated coating was uniform and Al₂O₃ particles were dispersed homogenously in YSZ matrix.

Keywords: YSZ/Al₂O₃; Composite coating; Electrophoretic deposition; Oxidation; Reaction bonding.

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