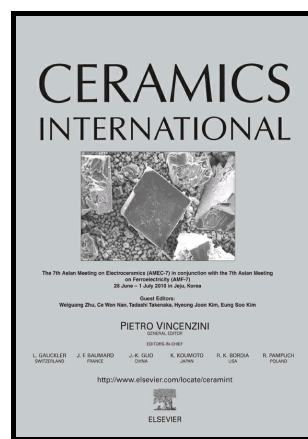


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Hot corrosion behavior of $\text{Ba}_2\text{REAlO}_5$ (RE = Dy, Er, Yb) ceramics by
vanadium pentoxide at 900-1000 °C

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Abstract

Hot corrosion behavior of $\text{Ba}_2\text{REAlO}_5$ (RE = Dy, Er, Yb) ceramics exposed to V_2O_5 molten salt at 900 °C and 1000 °C was investigated, providing a better understanding of their corrosion resistance as promising thermal barrier coatings. Obvious surface reactions occurred forming continuous, dense reaction layers on the top surfaces of the samples, the types of corrosion products being temperature and time independent. After heat treatment for 4 h and 20 h in V_2O_5 salt at the two temperatures, the corrosion products consisted of REVO_4 , $\text{Ba}_2\text{REV}_3\text{O}_{11}$ and BaAl_2O_4 (RE = Dy, Er, Yb). Prolonged heat treatment and elevated temperature promoted the growth of $\text{Ba}_2\text{REV}_3\text{O}_{11}$ and REVO_4 grains. The reaction layer had a positive function on suppressing further penetration of the molten salt. The mechanism by which the corrosion reaction occurs is proposed based on Lewis acid-base rule, phase diagrams

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