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Environmental-Barrier Coating Ceramics for Resistance Against Attack by Molten Calcia-Magnesia-Aluminosilicate (CMAS) Glass: Part II, β-$Yb_2Si_2O_7$ and β-$Sc_2Si_2O_7$

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Abstract

The high-temperature (1500 ˚C) interactions of two promising dense, polycrystalline EBC ceramics, β-$Yb_2Si_2O_7$ and β-$Sc_2Si_2O_7$, with a calcia-magnesia-aluminosilicate (CMAS) glass have been explored as part of a model study. Unlike $YAlO_3$ and γ-$Y_2Si_2O_7$ in the accompanying Part I paper, little or no reaction is found between the Y-free EBC ceramics and the CMAS. In the case of β-$Yb_2Si_2O_7$, a small amount of reaction-crystallization product Yb-Ca-Si apatite solid solution (*ss*) forms, whereas none is detected in the case of β-$Sc_2Si_2O_7$. The