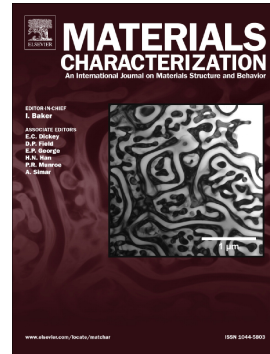


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Bismuth borate zinc glass braze for bonding sapphire in air

Wei Guo^a, Tong Wang^a, TiesongLin^{a,*}, ShuGuo^b, Peng He^{a,*}

^aState Key Laboratory of Advanced Welding and Joining, Harbin Institute of Technology, Harbin

150001, China

^b Center of Analysis Measurement, Harbin Institute of Technology, Harbin 150001, China

*Corresponding author. Email: hitjoining@hit.edu.cn (T. Lin), Tel.: +86 451 86403422.

hithepeng@hit.edu.cn (P. He), Tel.: +86 451 86402787.

Abstract:

Reliable brazing of sapphire was successfully achieved by using a novel 50Bi₂O₃–40B₂O₃–10ZnO (mol.%) glass braze and joining cycles that peak at temperatures of 600–700 °C for 20 min in air. The effect of the brazing temperature on microstructure evolution as well as mechanical properties of the sapphire/sapphire joints was investigated. The results showed that Bi₄B₂O₉ and Bi₂₄B₂O₃₉ were formed in the joints brazed at 600 and 625 °C, respectively. ZnAl₂O₄ particles were formed in the joints when the brazing temperature was 635 °C due to a reaction between the

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