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Highly Transparent Spinel Windows by Microwave Sintering

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ABSTRACT

Transparent magnesium aluminate spinel ($MgAl_2O_4$) ceramic possesses excellent mechanical and optical properties enabling its potential use in many applications, especially those in harsh environments. We have previously demonstrated fabrication of transparent spinel ceramic with very low absorption loss (6ppm/cm) at 1 μm using the hot pressing method. However, microwave sintering offers several potential advantages over conventional densification methods such as uniform heating, shorter sintering time, finer microstructure of the ceramics, and scalability to large sizes. Previous attempts to microwave sinter spinel powder resulted in only opaque or translucent ceramics. In this talk, we report the fabrication of highly transparent spinel ceramics using microwave sintering and highlight the optical, spectral, morphological and mechanical properties.