

STRATEGIES TO STRENGTHEN CERAMICS FOR WINDOWS AND DOMES

Ivar Reimanis, Colorado School of Mines, USA
reimanis@mines.edu

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Strengthening of transparent ceramics is highly constrained by the fact that the classic methods to toughen ceramics, via microstructure modification, increase light scattering. Nonetheless, improvements are possible when a composite approach is applied at the nanoscale. For example, attempts to toughen spinel by reinforcing with alumina show modest gains. This paper discusses those efforts and examines the possibility of applying the concept to other ceramics. Strategies and limitations for windows and domes, for which the transparency requirements are not as stringent as for some other optical applications, are discussed.

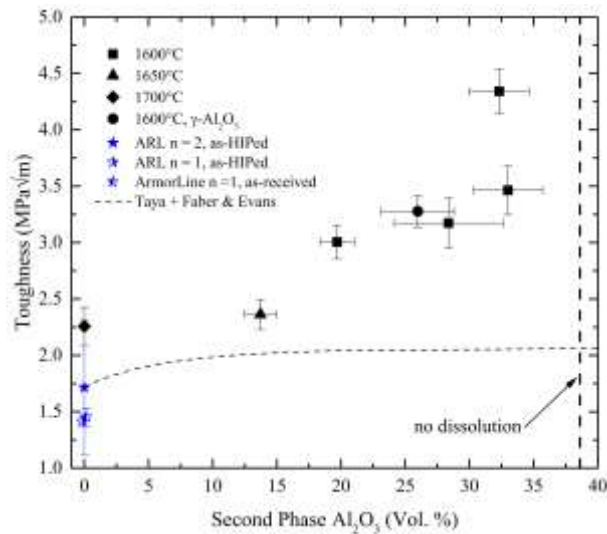


Figure 1 – Toughness for different spinels and spinel—alumina composites.