

## INTERFACE ENGINEERING IN OXIDE/OXIDE COMPOSITES

K.K. Chawla, University of Alabama at Birmingham, USA  
kchawla@uab.edu

Oxide fiber/oxide matrix composites are of interest because of their inherent high-temperature oxidation resistance. Specifically, we seek long-term, oxidation resistance at high-temperatures and damage tolerant materials. An undesirable feature of oxide/oxide composites is the reactivity between the oxide fiber and oxide matrix. This reaction may prevent the composite from developing a suitable interface necessary to achieve a high damage tolerance. To achieve a suitable interface, an interphase material is used, *i.e.*, the interface is engineered. Among the oxide interphase materials that have been tried are SnO<sub>2</sub>, LaPO<sub>4</sub>, and ZrO<sub>2</sub>. Porous oxide matrix as well as fugitive coatings have also been tried. All of these have the distinct characteristic that they do not react with alumina. We have also tried a novel interphase material, namely, BaZrO<sub>3</sub>. Alumina and BaZrO<sub>3</sub> do react, but form reaction products in situ during the high temperature processing with sharp and distinct interfaces. These interfaces allow crack deflection to occur; resulting in a damage tolerant behavior in alumina-based composites.