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**Preparation and Characterization of Mullite Fiber
Reinforced Alumina Matrix.**

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Abstract:

In the present study we succeeded in the preparation of short ceramic fiber reinforced alumina matrix composites which possess properties not tailored by alumina matrix. The composites were fabricated by mechanical mixing of 0, 5, 10, 15, and 20 wt% home – made mullite fibers having different aspect ratios with 95, 90, 85 and 80 wt% alumina matrix powder.

The specimens were sintered at temperatures between 1500°C and 1650°C. The ceramic matrix composites were characterized by determining their physical properties in terms of bulk density and apparent porosity as well as, their phase composition using X-ray diffraction analysis. SEM examination and mechanical measurement performed on only high density samples from each size fraction and fiber content. It was found that the properties of the prepared composites depended on the fiber content, the fiber/matrix interface and the fiber diameter. XRD analysis of the composites indicates that the fibers did not suffer degradation even when they were fired at elevated temperatures.

The study showed that it is possible to control the properties of the short oxide fiber reinforced – alumina matrix composite by controlling the content and diameter of the oxide fibers. Under such conditions it is easy to tailor the properties to a specific application.