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Sialon nano-composites matrix reinforced by cubic boron nitride prepared by using spark plasma sintering

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Aluminosilicate oxynitride and cubic Boron Nitride (cBN) composites having excellent mechanical properties and chemical stability in room temperature to high temperature applications. In the present study, cubic Boron Nitride (cBN) reinforced alpha-Sialon nano-composites were prepared using Spark Plasma Sintering (SPS) technique. The starting powders including Sialon precursors and various particles size of cBN (10, 20 and 30 wt.%) were homogeneously mixed by probe sonication before sintering. The effect of SPS processing parameters on the densification and mechanical behavior of these nano-composites were investigated. These cBN enabled in the densification sialon composite samples were analyzed for phase identification by X-ray diffraction. As well as, composite samples were evaluated to find cBN to hBN transformation in the Sialon matrix sintered at 1500 °C. Field emission scanning electron microscopy (FESEM) used for morphology and hardness and fracture toughness were measured.

Biography

Abbas Saeed Hakeem has completed his PhD from Stockholm University. He is a Research Scientist at Center of Excellence in Nanotechnology, King Fahd University of Petroleum and Minerals. He has published more than 25 papers in reputed journals.

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