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Synthesis and characterization of Al-Si₃N₄ nanocomposites processed by microwave sintering process

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Significant advancement in the processing technology has enabled to synthesize homogenous metal matrix nanocomposites having uniformly distributed nanoreinforcements. As a result, remarkable enhancement in the properties of metal matrix nanocomposites has been claimed. In present work, Si₃N₄ nanoparticles reinforced aluminium matrix composites (Al/Si₃N₄) containing different volume fractions (0.3, 0.6, 0.9 and 1.2 vol.%) of Si₃N₄ were fabricated using microwave sintering process. The Powders of Al and Si₃N₄ with exact stoichiometry ratios were intimately mixed through high energy ball milling (200 rpm, 2 hours) and were consolidated at room temperature (450 MPa for 2 min). The compacted cylindrical billets (diameter-30mm) were then sintered (550°C) using microwave sintering approach. Thereafter, the developed Al-Si₃N₄ nanocomposites were extruded (350°C) into rods (diameter-8mm) and their physical, structural, thermal and mechanical properties were investigated. In addition, the effect of Si₃N₄ volume fraction on the properties of Al/Si₃N₄ nanocomposites was also studied.

Biography

R A Shakoor is currently working as an Assistant Professor in the Center for Advanced Materials (CAM), Qatar University, Doha, Qatar. He holds a PhD degree in Materials Engineering. His area of research focuses on the synthesis and characterization of advance materials for various applications. He has been awarded with several academic and professional awards because of his outstanding academic, industrial and research achievements. His research work has been published in high impact factor international journals like *JACS*, *Adv. Functional Mater*, etc., with decent number of citations. He likes to share his important findings with local and international research communities.

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