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





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## Hardness and fracture toughness analysis of ZTA-SWCNT ceramic cutting inserts (Conference Paper)

Hamidon, N.E.<sup>a</sup> , Molok, S.A.<sup>a</sup> , Manshor, H.<sup>b</sup> , Azhar, A.Z.A.<sup>a</sup> , Rejab, N.A.<sup>c</sup> , Ahmad, Z.A.<sup>c</sup> , Ali, A.M.<sup>a</sup>  

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### Abstract

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Hardness and fracture toughness of ZTA samples with addition of SWCNT have been investigated. The composition of  $Al_2O_3/YSZ$  was constant at 80:20 ratios with the amount of SWCNT varied from 0.00, 0.05, 0.10, 0.30 and 0.50 wt %. The SWCNT was soaked in 20-ml ethanol and dispersed using ultrasonic agitation for 1 hour prior to addition with  $Al_2O_3/YSZ$  powder using wet mixing. The hardness and fracture toughness were calculated using Vickers indentation techniques. The Vickers hardness results show that presence SWCNT causes agglomeration in the microstructure of ZTA matrix as a result decreased hardness value. Meanwhile the fracture toughness of ZTA with 0.50 wt. % SWCNT increased to 6.593-MPa·m which is the highest value. In addition, the good dispersion of CNTs in ZTA matrix composites is with addition 0.10 wt. % of SWCNTs. © 2019 Author(s).

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