The Friction and Wear Behaviour of Ti2AlC MAX Phase

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Abstract : The effects of boronizing treatment on the friction coefficient and wear behavior of Ti2AlC were investigated. In order to modify the surface properties of Ti2AlC, boronizing treatment was carried out through powder pack cementation in the 1150-1350 °C temperature range. After boronizing treatment, one mixture layer, composed of TiB2 and SiC, forms on the surface of Ti2AlC. The growth of the coating is processed by inward diffusion of Boron and obeys a linear rule. The Boronizing treatment increases the hardness of Ti2AlC from 6 GPa to 13GPa. In the pin-on-disc test, it was found that the material undergoes a steady-state coefficient of friction of around 0.8 and 0.45 in case of Ti2AlC/Al2O3 tribocouple under 7N load for the non treated and the boronized samples, respectively. The wear resistance of Ti2AlC under Al2O3 ball sliding has been significantly improved, which indicated that the boronizing treatment is a promising surface modification way of Ti2AlC. **Keywords :** MAX phase, wear, hardness, boronizing

Conference Title : ICCST 2015 : International Conference on Ceramic Science and Technology

Conference Location : New York, United States

Conference Dates : June 04-05, 2015