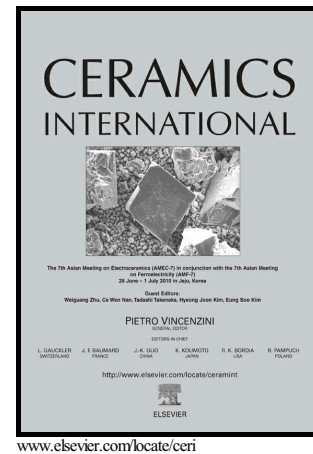


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Mechanical and tribological properties of nano/micro composite alumina coatings fabricated by atmospheric plasma spraying

Yulong An^a, Shuangjian Li^{a,b}, Guoliang Hou^{a*}, Xiaoqin Zhao^{a*}, Huidi Zhou^a, Jianmin Chen^a

^aState Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences,

Lanzhou 730000, PR China

^bUniversity of Chinese Academy of Sciences, Beijing 100049, PR China

houguoliang415514@163.com

zhaoxiaoqin@licp.cas.cn

*Corresponding authors.

Abstract

Adding nano particles can significantly improve the mechanical properties and wear resistance of thermal sprayed Al_2O_3 coating. However, it still remains a challenge to uniformly incorporate nano particles into traditional coatings due to their bad dispersibility. In the present work, nanometer Al_2O_3 (n- Al_2O_3) powders modified by KH-560 silane coupling agent were introduced into micrometer Al_2O_3 (m- Al_2O_3) powders by ultrasonic dispersion to afford nano/micro composite feedstock, and then four resultant coatings (weight fraction of n- Al_2O_3 : 0%, 3%, 5% and 10%) were fabricated by atmospheric plasma spraying. The features and constitutes of feedstock and as-sprayed coatings, as well as their porosity, bonding strength, microhardness and frictional behaviors were investigated in detail. Results show that the nano/micro

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