



论文摘要

中南大学学报(自然科学版)

ZHONGNAN DAXUE XUEBAO(ZIRAN KEXUE BAN)

Vol.32 No.3 Jun.2001

[PDF全文下载] [全文在线阅读]

文章编号: 1005-9792(2001)03-0281-04

不同制动速度下针刺毡炭/炭复合材料的摩擦磨损行为

熊翔, 黄伯云, 徐惠娟, 吉冬英, 彭剑昕

(中南大学粉末冶金国家重点实验室, 湖南长沙 410083)

摘要: 用模拟刹车制动的摩擦试验机, 研究了1种针刺毡结构炭/炭复合材料在不同制动速度下的摩擦磨损性能, 并在光学显微镜下直接对摩擦表面进行了观察和分析. 研究表明: 在制动速度为5 m/s或静态条件下, 针刺毡炭/炭复合材料的摩擦因数很低, 但在制动速度为10 m/s、能量较小时摩擦因数出现了峰值; 在制动速度升高到20m/s后, 摩擦因数较高且随刹车速度变化趋于稳定, 显示出优良的高能高温制动性能; 只要制动速度不是极高(如28 m/s), 这种材料均具有很好的抗磨损性能, 其中磨损量在制动速度为15 m/s时达到最大值, 该制动速度对应于飞机进出场滑行制动速度; 摩擦表面微观结构及氧化状况取决于制动条件的影响, 炭磨屑和基体炭在制动过程中会优先氧化.

关键字: 炭/炭复合材料; 针刺毡; 制动速度; 摩擦磨损

Frictional and wear behaviors of C/C composites from a needled felt at different braking speeds

XIONG Xiang, HUANG Bai-yun, XU Hui-juan, JI Dong-ying, PENG Jian-xin

(State Key Laboratory for Powder Metallurgy, Central South University, Changsha 410083, China)

Abstract: Frictional and wear behaviors of C/C composites from a needled felt were investigated at different braking speeds by simulating the aircraft braking with pairs of small circle samples. The frictional surfaces were examined with optical metallograph. The braking speeds increased from 0 in step of 5 m/s. At the speed 5 m/s or at static the friction coefficient is very low, but then it reaches to the maximum at the speed 10 m/s rapidly. At this moment the braking energy is low. When the speed is over 20 m/s the friction coefficient goes constant but keeps high enough, demonstrating its excellent high energy and high temperature braking property. On the other hand, except at the speed 28 m/s, its wear property is also excellent. At the speed 15 m/s there appears a small wear peak. Wear debris and braking speeds have influence on the microstructures of friction surfaces. Wear debris and the base carbon on the surface are preferentially oxidized during braking.

Key words: C/C composites; needled felt; braking speed; friction and wear

版权所有：《中南大学学报(自然科学版、英文版)》编辑部

地 址：湖南省长沙市中南大学 邮 编： 410083

电 话： 0731-88879765 传 真： 0731-88877727

电子邮箱： zngdxb@mail.csu.edu.cn 湘ICP备09001153号