



论文摘要

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高速电弧喷涂FeAlCr/Ni包Cr<sub>3</sub>C<sub>2</sub>  
复合涂层摩擦学特性徐维普<sup>1, 2</sup>, 徐滨士<sup>2</sup>, 张伟<sup>2</sup>, 吴毅雄<sup>1</sup>, 刘维民<sup>3</sup>( 1. 上海交通大学 材料学院, 上海 200030;  
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**摘要:** 使用THT07-135高温磨损试验机对高速电弧喷涂FeAl, Fe-Al/Cr<sub>3</sub>C<sub>2</sub>, FeAlCr/Ni包Cr<sub>3</sub>C<sub>2</sub>复合涂层进行了滑动摩擦特性的研究, 并用SEM、TEM、XRD等手段观察分析了磨痕的形貌和成分、涂层截面的组织和相结构。结果表明: FeAlCr/Ni包Cr<sub>3</sub>C<sub>2</sub>复合涂层具有典型的层状结构和较高的结合强度和硬度; 从室温到250℃, 涂层的抗磨损性能下降; 从250℃到550℃, 涂层磨损性能变化不大; 550℃以后, 涂层的耐磨性能重新增强; 剥层磨损是FeAlCr/Ni包Cr<sub>3</sub>C<sub>2</sub>涂层高温磨损的主要机理; Cr<sub>3</sub>C<sub>2</sub>增强相的加入, 大大提高了涂层的耐磨性能; Ni的加入一定程度提高了涂层的结合强度和抗磨损性能。

**关键字:** 高速电弧喷涂; 摩擦学特性; FeAlCr/Ni包Cr<sub>3</sub>C<sub>2</sub>复合涂层Tribological properties of high velocity arc sprayed FeAlCr/Ni wrapped Cr<sub>3</sub>C<sub>2</sub> coatingsXU Wei-pu<sup>1, 2</sup>, XU Bin-shi<sup>2</sup>, ZHANG Wei<sup>2</sup>,  
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**Abstract:** THT07-135 high temperature wear machinery was used to analyse tribological properties of high velocity arc sprayed FeAl, Fe-Al/Cr<sub>3</sub>C<sub>2</sub>, FeAlCr/Ni wrapped Cr<sub>3</sub>C<sub>2</sub> composite coatings. The wear scar morphologies and compositions of coatings were analyzed by SEM, TEM and XRD methods. Results show that FeAlCr/Ni wrapped Cr<sub>3</sub>C<sub>2</sub> composite coatings have typically layer shaped structure and relatively high bonding strength and hardness. The wear resistance of coatings decreases in the range from room temperature to 250℃, and it changes little in the range from 250℃ to 550℃, then wear resistance of coatings rises again after 550℃. Shell tribology behavior is mainly the high temperature wear mechanism of coatings. The addition of Cr<sub>3</sub>C<sub>2</sub> can improve the wear resistance of coatings highly; the addition of Ni can also relatively enhance bonding strength and wear properties of coatings.

**Key words:** high velocity arc spray; tribological characteristic; FeAlCr/Ni wrapped Cr<sub>3</sub>C<sub>2</sub> composite coating

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