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研究论文

钢表面颗粒增强熔覆层的组织和性能

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摘要: 采用预置法在45号钢表面制备WC颗粒增强熔覆层, 研究了熔覆层的组织和性能, 并与淬火态Cr12MoV(59HRC)的耐磨性能进行比较, 分析磨损机理并讨论WC颗粒的磨损现象。结果表明: 熔覆层与基材之间结合良好并形成界面反应层; 熔覆层组织分布均匀, 表面弥散分布着大量WC颗粒; 熔覆层的平均硬度比基材的高, 耐磨性是基材45号钢的18倍, 是淬火态Cr12MoV的2倍; 在磨损实验中熔覆层的增强颗粒WC出现罕见的表面磨平和脆性脱落现象。

关键词: 金属材料 颗粒增强 熔覆层 组织 界面反应 耐磨性能

Analysis of Microstructure and Properties of Particles Reinforced Cladding Layer on the Steel Surface

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Abstract: The WC reinforced cladding layer was prepared on the surface of 45 steel argon-arc cladding. The microstructure and properties of cladding layer were investigated. The wear mechanism of cladding layer and the appearance of WC reinforced particles in wear process were analyzed. The results show that the cladding layer is metallurgical bond with substrate and its structure disperses homogeneitily. There are lots of dispersing-distributed WC particles on the surface. And there is an interface reaction between WC particles and matrix. The average microhardness of the cladding layer is higher than that of substrate. The wear resistance of the cladding layer is 18 times higher than that of 45 matrix steel and is double that of the quenched Cr12MoV steel. The surface of the reinforced particles were polished rarely and spalled in wear process.

Keywords: metallic materials particle reinforce cladding layer microstructure interface reaction wear resistance

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