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论文

多层复合渗镀TiN耐蚀性的研究

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摘要:

采用双层辉光渗金属技术,在碳钢表面形成具有扩散层和沉积层的TiN复合渗镀层.对复合渗镀、PVD以及复合渗镀+PVD三种工艺制备的TiN层表面形貌、成分及在10%H<sub>2</sub>SO<sub>4</sub>和3.5%NaCl〔JP2〕溶液中的耐蚀性能进行了对比试验研究.结果表明:复合渗镀+PVD法沉积的TiN薄膜呈较为均匀、致密、细小的组织,Ti和N原子由表层呈梯度向内分布.与PVD法沉积的TiN层不同,是属于冶金扩散结合层,渗镀层厚度可达10 μm以上.在10%H<sub>2</sub>SO<sub>4</sub>和3.5%NaCl溶液中,渗镀层的腐蚀速度分别为0.156 g/(m<sup>2</sup>·h)和0.025 g/(m<sup>2</sup>·h),显示出了优异的耐蚀性.

关键词: 辉光等离子 PVD TiN层 结构 耐蚀性

CORROSION PROPERTY OF TiN MULTI-PERMEATED LAYERS

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Abstract:

TiN multi-permeated layers were formed on the steel surface with diffusion layer and deposition layer by means of both double glow-discharge surface alloying process and reactive sputtering.The surface appearances and composition and its corrosion-resistance in 10% H<sub>2</sub>SO<sub>4</sub> and 3.5% NaCl of TiN multi-permeated layers by using different processes were investigated.The results indicated that the TiN multi-permeated layer was uniform and compact,the content of atom Ti,N gradually decreased with increasing distance from the surface.The adhesion of the TiN coating was very strong,its thickness was more than 10 μm.The corrosion resistance of the TiN multi-permeated layer in 10% H<sub>2</sub>SO<sub>4</sub> and 3.5% NaCl was excellent,the corrosion rate was only 0.156 g/(m<sup>2</sup>·h) and 0.025 g/(m<sup>2</sup>·h),respectively.

Keywords: glow-discharge plasma PVD TiN structure corrosion resistance

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