

论文摘要

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金刚石颗粒强化银基复合镀层

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摘要: 在制备银基金刚石颗粒复合镀层的基础上, 研究了复合镀层的力学性能和电接触性能, 以及电镀工艺对镀层结构的影响。结果表明, 金刚石粉末能够提高银镀层的硬度, 降低其电磨损率, 从而提高电触头的寿命及耐大电流的能力。金刚石粒径越小、浓度越高(在一定的范围内), 强化效果越好。影响复合镀层结构的因素有很多, 各因素必须相互协调, 才可得到与衬底结合牢固的、颗粒均匀分布的结晶致密的复合镀层。镀液中金刚石含量不很高时, 其最优化工艺与常规镀银相仿, 使用适量的分散剂并加以搅拌有利于金刚石粉末在镀层中的均匀分布。

关键字: 复合镀层; 电接触材料; 金刚石微粉; 金刚石颗粒强化

Ag based composite coatings reinforced by diamond particulates

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Abstract: Based on well prepared silver coatings reinforced by diamond particulates, the mechanical and electrical properties of this composite coating, as well as the effect of electroplating process on coating microstructure were studied. The results show that with the addition of diamond particulates the hardness of the coating can be improved, and the rate of electrical wear reduced. Therefore, the contactor life and its ability of bearing large current can be increased. The finer the particulate dimension and the higher the concentration (within certain range), the better the reinforcement effect. Many factors may affect the microstructure of the composite coating. And they should therefore be compatible to achieve a firm combination between coating and matrix, and to make the composite coating structure compacted with uniform distribution of particulates. The optimized process is similar to the usual Ag electroplating on condition that the particulate concentration is not too high. In order to achieve a uniform distribution of particulates, it is better to add some dispersant and to give a stirring to the electroplating solution.

Key words: composite coating; electric contact material; diamond powder; diamond particulate reinforcement

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