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反应堆工程

316L不锈钢表面双层辉光离子渗金属技术制备Al_2O_3涂层

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摘要 Al_2O_3涂层由于具有较好的阻氚渗透效果可用作聚变堆第1壁涂层。利用双层辉光离子渗金属技术在316L不锈钢表面进行渗Al后热氧化处理，得到了致密的Al_2O_3涂层。对渗Al层的成分和形貌分别利用X射线衍射分析仪和扫描电子显微镜进行了分析和观察。结果表明：双层辉光离子渗金属技术能够制备出均匀致密、与基体结合良好的渗Al层。在316L不锈钢表面渗Al的最佳工艺参数条件下，获得的渗Al层经随后的热氧化处理，可形成质量良好的致密Al_2O_3涂层。

关键词 双辉；316L不锈钢；渗铝；氧化铝涂层

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Preparation of Al_2O_3 Coating on 316L Stainless Steel Substrate by Double Glow Plasma Surface Alloying Technique

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Abstract Alumina coating can be used as tritium barrier in fusion reactor due to its good tritium penetration resistance performance. Dense alumina coating was obtained by the oxidation of Al film prepared by the double glow plasma surface alloying (DGPSA) technique. The composition and cross section of Al films were studied by X-ray diffraction and scanning electron microcopy. The results show that uniform, dense and excellent combined Al films can be prepared. After oxidation treatment, alumina coating with high quality can also be prepared on the basis of the optimum parameters.

Key words double glow 316L stainless steel aluminizing alumina coating

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