

论文

离子束轰击对多层膜摩擦学性能的影响

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摘要: 用Ne离子束混合法制备了Ni / Cr多层膜,用Auger光电子能谱(AES)、X射线衍射(XRD)分析离子束混合多层膜的元素组成、分布和相结构,将其结果与简单蒸发沉积的Ni / Cr多层膜结构进行比较同时,对多层膜(轰击与未轰击)的硬度及摩擦学性能进行测定分析比较结果表明,离子束混合多层膜的硬度和抗磨性能与简单蒸发沉积多层膜相比都有提高这主要是因为Ne离子的轰击作用使多层膜更加致密及膜内的碳化铬硬质弥散相向界面处偏聚,使多层界面的强化作用得到加强,从而提高了多层膜的抗磨性能

关键词: 离子束混合 Ni / Cr多层膜 摩擦磨损 界面强化

THE INFLUENCE OF ION BEAM BOMBARDMENT TO THE TRIBOLOGICAL PERFORMANCE OF MULTILAYER FILM

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Abstract: Ni/Cr multilayer film was prepared by the way of Ne+ ion beam mixing. The distribution of elements and phase structure in Ni/Cr multilayer film were investigated using Auger electron spectroscopy sputtering depth profiles and X-ray diffraction analysis. The microhardness and tribological properties of multilayer film were measured. The results showed that Ni/Cr ion beam mixing multilayer film had high microhardness and anti-wear property compared with that of Ni/Cr multilayer film without ion beam bombardment. The high anti-wear property of ion beam mixing Ni/Cr multilayer film was attributed to the change of microstructure of the multilayer film and the dispersed chromium carbide microcrystals moved to the interfaces of multilayer film.

Keywords: ion beam mixing Ni/Cr multilayer film friction and wear interface strengthening

收稿日期 1997-11-18 修回日期 1997-11-18 网络版发布日期

DOI:

基金项目:

通讯作者:

作者简介:

作者Email:

参考文献:

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