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研究论文

Ag-Al2O3金属陶瓷复合薄膜的光学特性

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摘要:

采用磁控溅射技术在硼硅玻璃基片上沉积具有不同填充因子的Ag--Al2O3金属陶瓷复合薄膜,柔相济用紫外--可见--近红外分光光度计和透射电镜(TEM)分别表征复合薄膜的光谱特性及微观结构, 使用透射光谱及反 射光谱数据计算其光学常数, 研究了Ag--Al2O3复合薄膜的表面等离子体共振(SPR)吸收峰随填充因子的变化特征。结果表明, 在一定范围内, 随着填充因子的增大, SPR吸收峰增强、半峰全宽增大且峰位红移。

关键词: 复合材料 Ag--Al2O3金属陶瓷 Hadley方程 光学特性 表面等离子体共振(SPR)

Optical Properties of Ag–Al2O3 Cermet Composite Films

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Abstract:

The Ag–Al_2O_3 cermet composite films with different filling factor were deposted on borosilicate glass substrates by magnetron sputtering. The spectral properties and structures of the films have been analysed by UV–Vis–NIR spectrophotometer and transmission electron microscope (TEM) respectively. The optical constants of the films were calculated by means of the Hadley equation based on the transmittance spectra and reflectance spectra. The variation of the surface plasmon resonance (SPR) peaks with filling factor was investigated. The results show that in certain extent the FWHF(full–width at half maximum) and intensity of SPR peaks increase with increasing filling factor, and SPR peaks redshifts with increasing filling factor.

Keywords: composites, Ag– Al_2O_3 cermet, Hadley equation, optical properties, surface plasmon resonance (SPR)

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