

研究论文

溶胶粒径对氧化硅减反射膜结构和光学性能的影响

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摘要: 以正硅酸四乙酯为前驱体, 制备出粒径20--100 nm的二氧化硅溶胶。用提拉法在玻璃基片上制备出氧化硅基多孔减反射膜, 并研究了不同粒径的二氧化硅溶胶老化后溶胶胶粒的微观结构与相应的多孔氧化硅减反射膜微观孔结构的差异。结果表明, 颗粒粒径约20 nm的硅溶胶在老化过程中易团聚成较大的二次颗粒, 形成结构疏松的氧化硅多孔减反射薄膜。镀有这种减反射膜的玻璃, 其峰值透过率在波长510 nm处达到99.2%。

关键词: 无机非金属材料 减反射膜 溶胶凝胶法 氧化硅 粒径

Effect of Colloid Particle Sizes on Microstructure and Optical Properties of the Silica Antireflective Coatings

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Abstract: The silica sols of particle size 20--100 nm were prepared using tetraethyl silicate as precursor. The porous silica antireflective coatings were prepared on the glass by the dip-coating method. The microstructure of sol particles with different particle size after aging and their influence on porous silica antireflective coating were investigated. Results show that the small silica colloid particles with size 20 nm reunite into large secondary particles during the aging process. The antireflective coating prepared of secondary particles has the desired loose structure and the peak transmittance of glass with the antireflective coating reaches 99.2% at 510 nm.

Keywords: inorganic non-metallic materials antireflective coating sol-gel silica particle size

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