THERMOSTIMULATED STRUCTURAL TRANSFORMATIONS IN VACUUM-EVAPORATED SiO_x FILMS

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S u m m a r y

Using gravimetry, the microhardness method, infrared spectroscopy, multiple-angle ellipsometry, and atomic force microscopy techniques, the thermostimulated transformation of a silicon-oxygen phase structure which results in the formation of Si nanoinclusions in SiO_x films has been studied. Vacuum annealing of sprayed SiO_x films is demonstrated to lead to an increase of Si– O– Si bridges in the oxide lattice. As a result, oxide is densified, and the oxide surface is smoothed away. It is shown that the segregation of the Si and SiO_2 phases takes place due to oxygen transfer from slightly oxidized molecular complexes ($SiOSi_3$) to strongly oxidized ones.