Investigation of Atomic Composition and Optical Properties in Multilayer Systems of $SiO_2/TiO_2/Si$ after Ion Implantation with Ions of Noble Gases

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The all samples were implanted with Ne^+, Ar^+ and Kr^+ with the same fluence 3×10^{16} ions/cm^2 and the energy was 250 keV. With the help of RBS and SE methods were obtained the depth profiles of elements and the optical properties of the samples. It was noticed that mass of ions increase the dielectric function of all layers have been changed. It was noticed that transient layers between the SiO_2 and TiO_2 are formed. The atomic composition of these layers indicates that they are a mixture of Si, Ti and O elements. The dielectric functions of the study layers. The dielectric function of these layers confirms that the interaction of ions with the atoms of the target creates a layer that describes the EMA model well. Layer thicknesses determined on the basis of RBS and SE are in good agreement. The results of these studies indicate that the use of these measurement methods gives precise measurements.

Keywords: SiO_2TiO_2/Si, nuclear methods, ion implantation, RBS, ellipsometry

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