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ELEMENTAL COMPOSITION OF NANOSTRUCTURED SILICON

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The search and synthesis of modern nanomaterials, as well as an in-depth study of their physical properties, is a priority scientific and technical task. The uniqueness of properties of nanoscale and nanostructured objects is largely determined by atomic and electronic processes that take place both in volume and on the surface and significantly depend on the influence of dimensional effects. One of the promising nanocrystalline materials is nanostructured silicon, the properties of which depend largely on the method and modes of formation. Since the properties of formed layers of nanostructured silicon during chemical etching depend on the etchant composition and etching time in the work was a detailed study of the elemental composition of nanostructured silicon layers formed on the surface of monocrystalline and textured silicon for solar cells by the method of Auger spectroscopy. Nanostructured silicon layers were obtained by stain etching (chemical etching) of initial and textured monocrystalline silicon. The surface morphology of nanostructured silicon was studied using a scanning electron microscope and a scanning tunneling microscope. It is shown that depending on the etchant composition and the concentration ratio of its components, there is a significant change in the elemental composition distribution of nanostructured silicon. The latter is crucial for optimizing the formation modes of nanostructured silicon layers with preset properties for use in solar cells, as a new type of silicon optoelectronic devices, the active element of biological and biochemical sensors.

Topics

Session A. Physics of condensed matter and spectroscopy

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