

Monatomic thickness Ag nanostructures on Si (111) surface

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Scanning tunneling microscopy study the processes of formation of monatomic silver nanostructures on the Si (111) was carried out under UHV conditions.

Before deposition of silver topography images of the surface of Si(111) 7x7 reconstruction were obtained in order to proof cleanness of substrate. After that on the surface Si(111) was deposited silver by thermal evaporation. The STM topography image shown on Figure 1a. testifies the formation of monatomic thickness silver layers with an average step height of 0.23 nm. In the STM image observed up to four single layers.

After annealing of the sample at 300 °C the STM images shows up to three single layers of the nanostructure (Fig.1b).

At temperature of 400 °C during second annealing the silver was evaporated from the surface and reconstruction of Si(111) 7x7 was found.

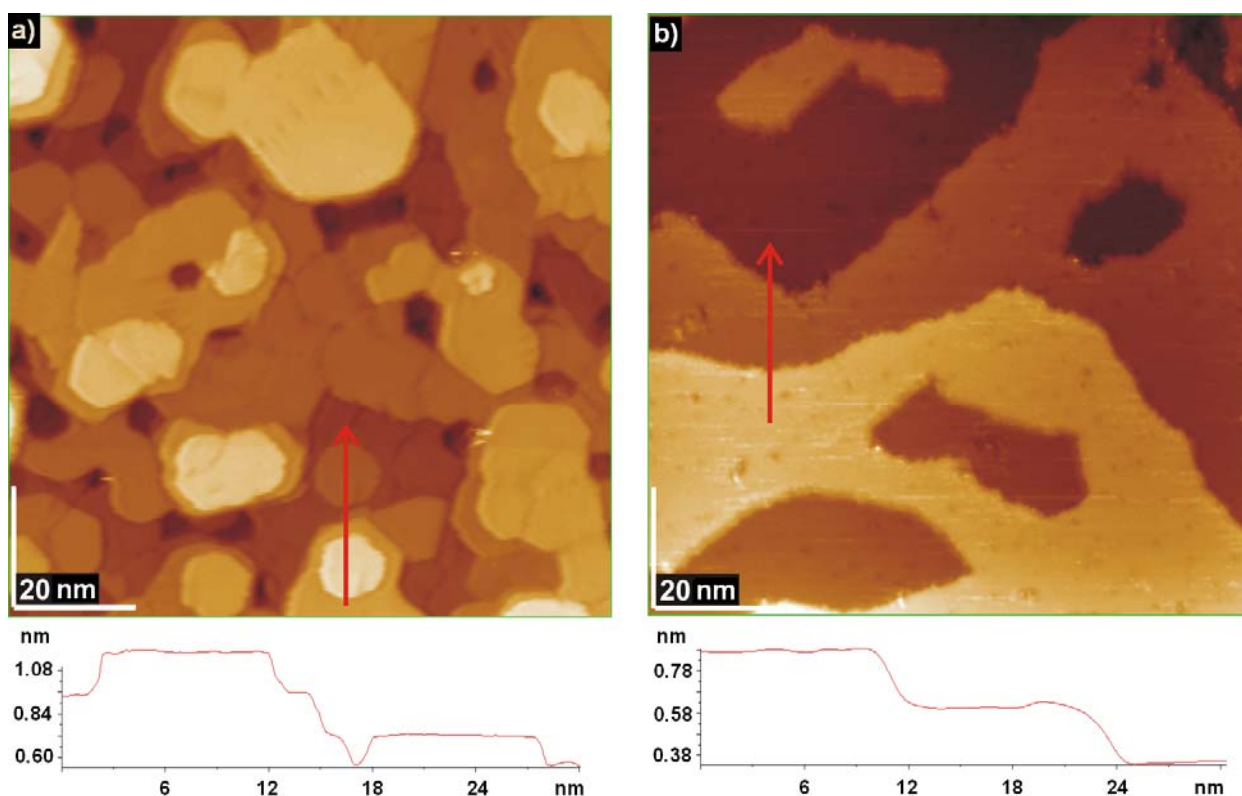


Figure 1. Silver on the surface of a single crystal silicon Si(111).

Ag on the surface of the Si can form a monatomic layered structure. With increasing temperature, occurs the evolution of the surface nanostructure. The amount of layers decreases. When the sample is heated to a temperature of 400 °C takes place desorption of silver atoms, and recover the structure of the Si (111) 7x7.