GOLD PATTERNS ON *n*-SILICON SURFACE FOR SENSORIC APPLICATION

Victoria Bundyukova, Dzmitry Yakimchuk, Vladislav Prigodich

Scientific-Practical Materials Research Centre of the NAS of Belarus, 220072 Minsk, Belarus
victoria.bundyukova@gmail.com

Silicon as a widely used semiconductor material, is used to a wide range of scientific and engineering applications, such as photovoltaic, nanoelectronic, sensitive biosensor devices, etc [1], [2]. The possibility of modifying silicon with various metals allows it to be used as the basis for sensor devices. Numerous works describe the method of electrodeposition of noble metals on the silicon surface to form a microrod array [3], [4]. However, this one has various limitations, including the size of the formed nanoparticles and morphology, the unevenness of the coating thickness, etc [5].

In this work, a galvanic deposition method was used to obtained gold nano patterns on a silicon surface of n-types from a salt of AuCl3 · (H2O) in aqueous solution at various temperatures. The concentration of gold ions in the initial solution was 0.01 M with the subsequent addition of 5 M HF acid in a 1:1 ratio. The morphological and structural properties of the resulting structures were studied depending on the temperature of the gold solution.

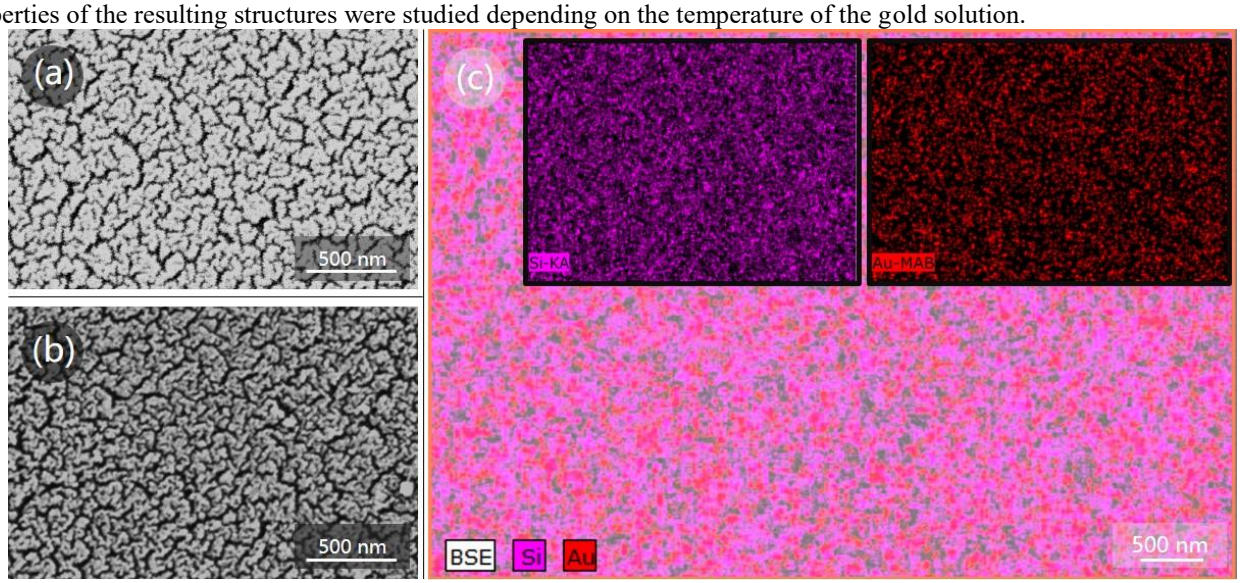

Fig. 1. SEM images of gold NSs on Si template deposited from $AuCl_3$ solution at different temperatures: (a) – 25ºC; (b) – 50 ºC; (c) – EDX-map corresponding to the SEM image (a).

The obtained gold nanopatterns demonstrated the potential use for Raman signal amplification on a reference analyte Rhodamine 6G with a concentration of 10^{-6} M. Thus, there is a possibility of using gold nanotracks as SERS-active surfaces for sensors.

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