



Silicon solar cells textured using gold of induced etching

K.K. Dikhanbayev*, Ye. Shabdan, Ye. Sagidolda, Sh. B. Bayganatova, G. K. Mussabek, Sh.A.Zhumatova

Department of Physics and Technology, Al-Farabi Kazakh National University,

Almaty, 050000, Kazakhstan

*E-mail: nanotechkz2012@gmail.com

**E-mail: dksolar2017@gmail.com

As is known, a layer with a dielectric coating remains the standard of a photoelectric converter and many research groups are studying various alternative methods to achieve an antireflection effect in silicon for photovoltaic and other optoelectronic applications [1]. Some of these methods include electrochemical etching [2], sol-gel deposition [3], magnetron sputtering of metal oxide films [4], and anisotropic etching [5].

Ready-made structures with a p-n junction were used as the initial substrate, the specific resistivity of the n⁺ layer was 0.008-0.01 Ohm·cm and the total plate thickness was 300 μm. Then, the front side of the sample is chemically activated in a solution of 0.4 mM, HAuCl₄ for 3-5 s, after which it is thoroughly washed in deionized water.

The output parameters of solar cells were determined from the characteristics. In particular, open circuit voltage $U_{oc} = 610$ mV, short-circuit current $I_{sc} = 32$ mA / cm², duty cycle $\xi = 0.77$, light emission power $P_{max} = 100$ mWt /cm², efficiency is ~ 15.03%.

References

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