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An introduction to lithography methods and providing a practical method for its optimization

S R Hosseini and A Nahal*

Photonic Materials Research Laboratory, Department of Physics, College of Science, University of Tehran, Tehran, Iran

E-mail: nahal@ut.ac.ir

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Abstract

In the first part of the present article, the important and main methods of photolithography are reviewed and discussed. Then we introduce the ways to improve the images created on the photoresist, which is the main material of lithography. Lithography with high-energy particle and soft lithography are then described. In the second part, the contact-photolithography method and its improvement process, which we use in our laboratory, are introduced and described in detail. We used this method for lithography to make diffraction optical elements on a glass substrate, doped by silver nanoparticles, using a helium ion beam. Light diffraction from the created lithography masks prevents access to very small images. To reduce the diffraction influence on the quality of the produced elements, we adapted and optimized the contact-lithography method for our project. Our solution, presented in this article, is practical and available for other researchers in Iran.

Keywords: lithography, light-sensitive materials, photoresist

For full article, refer to the Persian section