

Invention relates to photolithography and can be used in the production of lithographic masks on the surface of semiconductor and dielectric wafers in microelectronic and optical manufacturing. The method includes pre-forming a periodic grating with a specified spatial frequency on the substrate surface by interference lithography or thermal embossing. Furthermore, an adhesive Cr layer, an Ag layer, and a chalcogenide compound (binary or ternary compounds of As, Ge, S, and Se) are sequentially deposited in a vacuum by thermal or electron-beam evaporation, laser or high-frequency magnetron sputtering. Exposure is carried out using p-polarized laser radiation of a spectral composition corresponding to the interband absorption edge of the chalcogenide, at an angle of incidence that ensures maximum excitation efficiency of surface plasmon-polaritons at the Ag-ChC interface. The grating lines are oriented perpendicular to the plane of radiation incidence. The process is completed by selective etching of the photoresist. The technical result of the invention is an increase in the sensitivity of chalcogenide photoresists, acceleration of the fabrication of photomasks and lithographic masks due to a reduction in exposure time.