



Iranian Journal of Physics Research, Vol. 24, No. 2, 2024
DOI: 10.47176/ijpr.24.2.21649

Investigating the effect of annealing on structural and optical properties of TiO₂ and SiO₂ broadband reflective layers coated by the plasma sputtering method

H Salmaniannezhad^{1,3}, H Salmaniannezhad^{1,3}, R Zarei Moghadam², M R Khani^{1,3}, and B Shokri^{1,3*}

1. Laser and Plasma Research Institute, Shahid Beheshti University, Tehran, Iran
2. Department of Physics, Faculty of Sciences, Arak University, Arak, Iran
3. Faculty of Physics, Shahid Beheshti University

E-mail: b-shokri@sbu.ac.ir

(Received 14 February 2023 ; in final form 21 June 2023)

Abstract

In this article, the effect of annealing on the structural and optical properties of TiO₂ and SiO₂ antireflection coatings was investigated. The thin layer was placed on the silicon substrate by sputtering and then annealed for 1 hour at different temperatures. By examining the optical properties of the samples, it was observed that after annealing, the reflection from the surface in the wavelength range of 450-750 nm decreased from 2.7 to 0.23%. The refractive index of the samples also decreased after annealing. Also, by examining the structural properties of the samples, the anatase phase before annealing and the mixture of anatase and rutile and the increase in the intensity of the peaks after annealing were observed.

Keywords: anti-reflective coatings, sputtering, annealing

For full article, refer to the Persian section