

STUDY OF NANOCRYSTALLINE  
TITANIUM DIOXIDE FILM SYNTHESIS  
IN A MAGNETRON-TYPE DISCHARGE  
BY MONITORING ITS OPTICAL  
AND PLASMODYNAMIC  
CHARACTERISTICS

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S u m m a r y

We present the results of experimental researches of plasmodynamic and optical characteristics of a magnetron-type cylindrical gas discharge. The study was carried out provided a permanent monitoring of the spectrum emitted by plasma in the range 350–820 nm. For the synthesis of binary compound TiO<sub>2</sub>, we have determined conditions which can be ensured by a support of the intensity of spectral lines emitted by reacting components and plasma-forming gas. A possibility to control the conditions of the fabrication of a TiO<sub>2</sub> film with the use of both the spectral characteristics of a discharge plasma and a variation of the discharge voltage has been analyzed. Ellipsometric and spectral studies of nanocrystalline titanium dioxide films revealed the dependence of the refractive index of a film on the film thickness.