

The Sixth International Conference
on Physical and Numerical Simulation
of Materials Processing

ICPNS 2010

November 16-19, 2010

Guilin, China



ABSTRACTS & PROGRAM

The 6th International Conference
on Physical and Numerical Simulation
of Materials Processing



Nov.16-19, 2010
Guilin,China

Organized by

Chinese Mechanical Engineering of Society
Guilin University of Electronic Technology
Huaqiao University
Henan Polytechnic University

Co-supported by

National Natural Science Foundation of China
The Minerals, Metals and Materials Society, USA
Dynamic Systems Inc. USA
Fuji Electrical Industrial Co. Ltd., Japan
Harbin Institute of Technology,China

Surface Characterization of Antireflective Thin Films

J. Setina, G. Mezhinskis

Riga Technical University, Azenes St. 14/24, Riga-LV-1084, Latvia, Phone: +371 67089257; janina@ktf.rtu.lv

Abstract:

In the visible part of the electromagnetic spectrum, a flat glass substrate reflects 8-9 % of the incoming light. In some cases this reflectance is undesired in optical layer systems consisting of many individual elements.

Several techniques such as magnetron sputtering, spray pyrolysis, sol-gel, chemical vapor deposition can be used to prepare anti-reflex thin films.

Magnetron sputtering of anti-reflex film systems on glass substrates has suffer from a problem with long – term stability and low deposition rates.

Oxides are an important class of coating materials, because they generally form chemically and environmentally stable films with a good variety of refractive indices and spectral ranges of high transmission.

This article gives an overview of anti-reflex thin film with different number (on one or both sides) of SiO_2 and TiO_2 layers on flat glass substrate obtained by magnetron sputtering system. Thickness of film depend on covering parameters and number of layers changes in range from 64 to 268 nm.

The surface properties of film by SEM, AFM and optical properties (refractive index, reflectance, translucency) was determined. The surface roughness and anti-reflex index depends on its preparation conditions. The highest translucency in range from 200 to 1100 nm was reached for both side four layers samples up to 97%.

In order to clarify influence of environmental conditions to surface properties covered samples was tested in climate camera. Final results of experiments show that different environmental factors do not change quality of film surface and light reflection.