

THEORY OF THE ELLIPSOMETRY OF A LAYER
OF SEMICONDUCTOR NANOPARTICLES
COVERING THE SUBSTRATE

E.G. Bortchagovsky¹, V.Z. Lozovski^{1,2}, T.O. Mishakova²

¹V.E. Lashkarev Institute of Semiconductor Physics,
Nat. Acad. of Sci. of Ukraine
(45, Nauka Ave., Kyiv 03028, Ukraine;
e-mail: bortch@yahoo.com),

²Taras Shevchenko National University of Kyiv,
Faculty of Radiophysics
(2/5, Academician Glushkov Ave., Kyiv 03127, Ukraine;
e-mail: mishakov@e-mail.ua)

S u m m a r y

A theoretical model of ellipsometry of a submonolayer of semiconductor nanoparticles on a surface is built in the frame of the local field method. We calculated the effective susceptibility of the system which had been modeled as a substrate with ellipsoidal particles. These calculations allow us to determine the reflection coefficients and the ellipsometric parameters versus the wavelength and the angle of incidence. It is shown that semiconductor particles on a substrate give a measurable contribution to ellipsometric parameters. We obtain that ellipsometric parameters depend on the concentration and the shape of particles.