Nanostructured surfaces

Electrical and optical properties of $LaNi_5$ and $CeNi_5$ nanoscale films

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Rare earth compounds are widely used in many applications, so that their optical and electrical properties deserve special attention [1]. In this article we present conditions to obtain homogenous thin layers of $LaNi_5$ and $CeNi_5$. Our method of choice to obtain these thin films was laser-induced evaporation, using short and modulated impulses, with electro-optical tuning for the quality factor. The layers obtained using a single laser burst had thicknesses between 1,5-2,5 nm.

Structural and compositional studies of nanometer thickness films were made using XRD. The temperature dependence of electrical conductivity was also determined. We also studied the following optical properties of our thin films: reflexion spectra, spectral dependence of the refraction coefficient, optical dispersion index, optical absorption coefficient, real and imaginary part of the complex dielectric coefficient [2]. The valence band studies were made using XPS [3]. These determinations, correlated with the optical ones permitted the evaluation of the energy densities of surface states.

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2. *Todoran D., Todoran R., Szakács Zs.*, Optical luminescence studies of xanthates adsorption layer at solid-liquid interface // Physica Scripta.-2013.-**T157**.–P. 014032

3. *M. Coldea, V. Pop, M. Neumann, Daniela Todoran, O. Isnard,* X-Ray photoelectron spectroscopy and magnetism of Al5Gd3Ni2 and Al8Gd5Ni2 compounds // Romanian Journal of Physics.-2003.-**48**, Supp. I.-P. 229-235.