

OPTICAL AND VIBRATIONAL CHARACTERIZATION OF NANOSTRUCTURED SEMICONDUCTOR MATERIALS

IVAN KARBOVNYK*

*Department of Electronics, Ivan Franko National University of Lviv,
Lviv, Ukraine*

Abstract There are several technologically relevant semiconductors that through the years were in the focus of an extensive research. Among these one can outline aluminum nitride (AlN) – chemically inert, thermally stable and having excellent mechanical properties wide band gap III–V semiconductor and silicon carbide (SiC) – a promising semiconductor for high-temperature applications, able to withstand high radiation loads and existing in several polytypes which, in turn, have own specific unique properties. A leap in the nanotechnology opened the way towards creating various semiconductor nanostructures like nanorods, nanobelts, nanowires etc. with even more fascinating features than the bulk materials. For example, a particularly interesting possibility is the obtaining of an adjustable emission from a nanostructured semiconductor by changing the size/diameter of nanowires. In this manner LEDs covering the entire visible range can be created.

This report dealt with some recent results obtained in the study of aluminum nitride and silicon carbide 1D nanostructures – nanotubes and nanowires. Details of the experimental techniques were discussed. The luminescence properties of the investigated nanomaterials were compared to those of commercially available reference samples.

* Ivan Karbovnyk, Department of Electronics, Ivan Franko National University of Lviv, Lviv, Ukraine, e-mail: ivan_karbovnyck@yahoo.com