

ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΟΥ ΔΙΠΛΩΜΑΤΟΣ ΕΙΔΙΚΕΥΣΗΣ

Τίτλος

«Optical and electronic properties of bulk and monolayer germanane»

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Πέμπτη, 11/10/2018,

11:00 μ.μ.,

Αίθουσα Β2,

Κτίριο Τμήματος Χημείας,

Πανεπιστήμιο Κρήτης

Abstract

In recent years, there has been a resurgence of interest in studying group IV graphane analogues, a class of materials that display distinctive properties in their two dimensional form. Their exceptional electronic, optical, mechanical, chemical, and thermal properties make them highly attractive for both fundamental studies of novel phenomena and applications ranging from optoelectronic and sensing devices.

This dissertation focused on the optical properties of bulk material GeH, one material that is at the forefront of sp³ – hybridized group IV elements. The group IV graphane analogues

represent a new family of single atom-thick two-dimensional materials, in which the structure, stability and properties can be tailored for covalent ligand termination. These materials have attracted considerable interest as electronic, optoelectronic and topological devices. Firstly, bulk samples were prepared through drop casting method and were identified via Raman Spectroscopy and Atomic Force Microscopy. The former has been widely adopted as the standard method for bulk and few-layer identification while the latter can be used to accurately determine both the vertical and lateral dimensions of nanolayered materials. The next step involved studying the optical properties of bulk crystals as function of temperature. Therefore, samples were cooled to the liquid nitrogen temperature and their emission spectra were studied in the temperature range 80-300K using micro-Photoluminescence and μ - Reflectance Spectroscopy.