Electronic structure of stable facets in the 2D material hBN/Pt system

Alaa Mohammed Idris Bakhit [1]
Khadiza Ali [2], Frederik Schiller [1]
[1]*Centro de Física de Materiales, Paseo de Manuel Lardizabal, 5, 20018 Donostia-San Sebastian, Spain.*
[2]*Chalmers University, Chalmersplatsen 4, 412 96 Göteborg, Lund, Sweden.*
alaa.mohammed@ehu.eus

Abstract

We present the study of hexagonal boron nitride (hBN) grown on a curved crystal substrates c-Pt, reporting the electronic structure properties of the stable facets. We encountered (111), (221), (441) and (110) as stable facets, studied by low-energy electron diffraction (LEED) and scanning tunnelling microscopy (STM).
The electronic structure was characterized by Near Edge X-ray Absorption Fine Structure (NEXAFS) spectroscopy and X-ray photoelectron spectroscopy (XPS). We observed that the hBN/Pt(111) system is the weakest interacting overlayer system, in contrary to the side facets which are strongly bound to the c-Pt substrate.
Additionally, we determined using Angle-resolved photoemission measurements (ARPES), a π band energy shift around (1.3 eV) due to the changed hBN/c-Pt interaction between the electronic bands at (111) and (110) facets.