

## Epitaxial graphene on SiC(0001): a photoelectron diffraction study

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DOI: <https://doi.org/10.5196/physicae.proceedings.XIYRM.34>

### Resumo

A flat, single layer of graphite known as graphene has become the focus of studies due to its exceptional properties and fascinating applications. Large scale graphene layers for a possible application can be grown epitaxially on SiC by Si sublimation [1]. Even before the interest in graphene, the surface of SiC was already extensively studied [2],[3]. It exhibits a large variety of surface reconstructions and these reconstructions are very dependent of sample preparation and orientation (0001) or (000-1). In this study, we show a investigation of the structural properties of graphene layers on SiC (0001) by photoelectron diffraction (XPD). The surfaces were prepared by heating the 1x1 surface to temperatures of about 1150 in high ultra vacuum and the various reconstructions were monitored by Low Energy Electron Diffraction (LEED) and X-Ray Photoelectron Spectroscopy (XPS). In particular for the Si terminated surface, that is SiC(0001), the interface between graphene and SiC is characterized by the so-called  $(6\sqrt{3} \times 6\sqrt{3})R30^\circ$  reconstruction (buffer layer). The interpretation of this reconstruction, which is the initial stage of graphitization, has lead to controversy in the literature [2]. We will further discuss the buffer layer structure in terms of the XPD results. The XPD experiments were performed at SGM beam line at LNLS using photons with 450 eV probing the Si2p and C1s core level. The C1s signal was separate in to contributions from volume and surface and compares the experimental results with photoelectron multiple scattering calculations performed with the MSCD package [4].