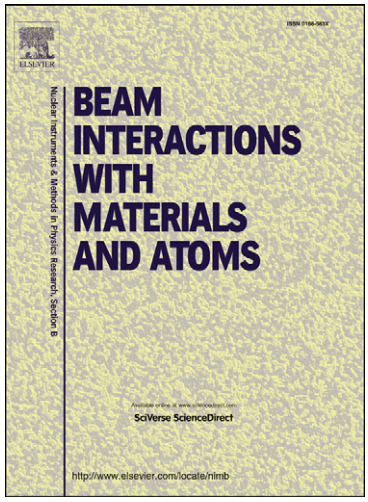
Accepted Manuscript



Novel aspects on the irradiation of HOPG surfaces with slow highly charged ions

R. Ritter, Q. Shen, R.A. Wilhelm, R. Heller, R. Ginzel, J.R. Crespo López-Urrutia, S. Facsko, C. Teichert, F. Aumayr

PII: S0168-583X(13)00279-6
DOI: http://dx.doi.org/10.1016/j.nimb.2013.02.025
Reference: NIMB 59329

To appear in: *Nucl. Instr. and Meth. in Phys. Res. B*

Received Date: 11 October 2012
Revised Date: 13 February 2013
Accepted Date: 28 February 2013

Please cite this article as: R. Ritter, Q. Shen, R.A. Wilhelm, R. Heller, R. Ginzel, J.R. Crespo López-Urrutia, S. Facsko, C. Teichert, F. Aumayr, Novel aspects on the irradiation of HOPG surfaces with slow highly charged ions, *Nucl. Instr. and Meth. in Phys. Res. B* (2013), doi: http://dx.doi.org/10.1016/j.nimb.2013.02.025

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Novel aspects on the irradiation of HOPG surfaces with slow highly charged ions

R. Ritter[1], Q. Shen[2], R. A. Wilhelm[3,5], R. Heller[3], R. Ginzel[4], J. R. Crespo López-Urrutia[4], S. Facsko[3], C. Teichert[2] and F. Aumayr[1]

[1]*Institute of Applied Physics, TU Wien, 1040 Vienna, Austria, EU*

[2]*Institute of Physics, Montanuniversität Leoben, 8700 Leoben, Austria, EU*

[3]*Institute of Ion Beam Physics & Materials Research, Helmholtz-Zentrum Dresden-Rossendorf, 01328 Dresden, Germany, EU*

[4]*Max Planck Institute for Nuclear Physics, 69117 Heidelberg, Germany, EU*

[5]*Technische Universität Dresden, 01062 Dresden, EU*

ABSTRACT

As a continuation of our previous work, we present new results regarding the interaction of slow highly charged ions with HOPG. Lateral atomic force microscopy measurements with calibrated cantilevers were performed to investigate in more detail the locally enhanced friction at ion impact sites, which has been reported earlier. For very high charge states, apart from ever-present changes in frictional and electronic properties, we find evidence for true topographic surface modifications (hillocks). In complementary studies, we have investigated these structures regarding their conductivity by employing high-resolution conductive atomic force microscopy. In addition, we demonstrate the possibility to etch ion-induced surface structures by thermal annealing.

Keywords: HOPG, highly charged ions, nanostructuring, AFM, STM, friction

Corresponding author: F. Aumayr, Institut f. Angewandte Physik, TU Wien
Wiedner Hauptstr. 8-10/134, A-1040 Vienna, Austria
Tel.: +43 1 58801 13430, Fax: +43 1 58801 13499
aumayr@iap.tuwien.ac.at

ACCEPTED MANUSCRIPT

Download English Version:

https://daneshyari.com/en/article/8042431

Download Persian Version:

https://daneshyari.com/article/8042431

Daneshyari.com