Accepted Manuscript

An etching phenomenon exhibited by chemical vapor deposited graphene on a copper pocket

Zhijuan Zhao, Xiangping Chen, Cankun Zhang, Wen Wan, Zhifa Shan, Bo Tian, Qiongyu Li, Hao Ying, Pingping Zhuang, Richard B. Kaner, Weiwei Cai

PII: S0008-6223(16)30392-X

DOI: 10.1016/j.carbon.2016.05.038

Reference: CARBON 11002

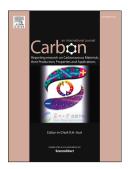
To appear in: Carbon

Received Date: 18 February 2016

Revised Date: 17 April 2016 Accepted Date: 15 May 2016

Please cite this article as: Z. Zhao, X. Chen, C. Zhang, W. Wan, Z. Shan, B. Tian, Q. Li, H. Ying, P. Zhuang, R.B. Kaner, W. Cai, An etching phenomenon exhibited by chemical vapor deposited graphene on a copper pocket, *Carbon* (2016), doi: 10.1016/j.carbon.2016.05.038.

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

An Etching Phenomenon Exhibited by Chemical Vapor Deposited Graphene on a Copper Pocket

Zhijuan Zhao^{a, b}, Xiangping Chen^a, Cankun Zhang^a, Wen Wan^a, Zhifa Shan^a, Bo Tian^a, Qiongyu Li^a, Hao Ying^a, Pingping Zhuang^a, Richard B. Kaner^{b,*} and Weiwei Cai^{a, c,*}

^a Department of Physics, State Key Laboratory of Physical Chemistry of Solid Surfaces, Xiamen University, Xiamen, Fujian 361005, China

^bDepartment of Chemistry and Biochemistry, California NanoSystems Institute, University of California, Los Angeles (UCLA), Los Angeles, CA 90095, USA

^cXiamen G-CVD Material Technology Co. Ltd, Xiamen 361005, China

ABSTRACT: What causes graphene etching is still controversial. Here we report a special etching phenomenon on the outer surface of a copper (Cu) pocket, while large-size graphene domains grow slowly on the inner surface. A systematic study along a time axis was conducted to investigate this etching process through isotope-tracing. When millimeter-size graphene domains on the inner surface joined together, the original monolayer graphene with a few residual multilayers stayed behind on the outer surface, indicating that multilayer graphene formed in the interim subsequently disappeared. Combined with our previous work, we conclude that the etching phenomenon is analogous to a counter diffusion process that keeps a stable monolayer of graphene on both sides of the Cu foil. Low C solubility and poor C saturation in Cu appear to drive this counter diffusion and help keep the stable state. Furthermore, we used a

Download English Version:

https://daneshyari.com/en/article/7849417

Download Persian Version:

https://daneshyari.com/article/7849417

<u>Daneshyari.com</u>