Facile electrochemical transfer of large-area single crystal epitaxial graphene from Ir(1 1 1)
- DTU Orbit (27/12/2018)

Facile electrochemical transfer of large-area single crystal epitaxial graphene from Ir(1 1 1)
High-quality growth of graphene and subsequent reliable transfer to insulating substrates are needed for various
technological applications, such as flexible screens and high speed electronics. In this paper, we present a new
electrochemical method for the transfer of large-area, high-quality single crystalline graphene from Ir(1 1 1) to Si/SiO2
under ambient conditions. The method is based on intercalation of tetraoctylammonium ions between the graphene layer
and the Ir surface. This simple technique allows transfer of graphene single crystals having the same size as the substrate
they are grown on (diameter ≈7 mm). In addition, the substrate can be reused for further growth cycles. A detailed Raman
map analysis of the transferred graphene reveals straight lines, in which the Raman peaks characteristic for graphene are
shifted. These lines originate from scratches in the Ir(1 1 1) crystal introduced by the polishing procedure. Furthermore,
areas with numerous wrinkles exist inbetween these lines, forming a network across the entire graphene crystal. Hence,
the initial characteristics and imprints left on the sheet of graphene in terms of strain and wrinkles from the growth process
remain after transfer.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, Nanointegration, Center for Nanostructured Graphene, Aarhus
University, Newtec A/S
Contributors: Koefoed, L., Kongsfelt, M., Ulstrup, S., Čabo, A. G., Cassidy, A., Whelan, P. R., Bianchi, M., Dendzik, M.,
Number of pages: 10
Pages: 115306
Publication date: 2015
Peer-reviewed: Yes

Publication information
Volume: 48
Issue number: 11
ISSN (Print): 0022-3727
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 2.38 SJR 0.717 SNIP 1.011
Web of Science (2017): Impact factor 2.373
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 2.07 SJR 1.135 SNIP 1.122
Web of Science (2016): Impact factor 2.588
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 2.1 SJR 0.886 SNIP 1.25
Web of Science (2015): Impact factor 2.772
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.53 SJR 1.096 SNIP 1.408
Web of Science (2014): Impact factor 2.721
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.6 SJR 1.194 SNIP 1.452
Web of Science (2013): Impact factor 2.521
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.31 SJR 1.279 SNIP 1.414
Web of Science (2012): Impact factor 2.528
ISI indexed (2012): ISI indexed yes