Raman spectral indicators of catalyst decoupling for transfer of CVD grown 2D materials - DTU Orbit (26/03/2019)

Raman spectral indicators of catalyst decoupling for transfer of CVD grown 2D materials

Through a combination of monitoring the Raman spectral characteristics of 2D materials grown on copper catalyst layers, and wafer scale automated detection of the fraction of transferred material, we reproducibly achieve transfers with over 97.5% monolayer hexagonal boron nitride and 99.7% monolayer graphene coverage, for up to 300 mm diameter wafers. We find a strong correlation between the transfer coverage obtained for graphene and the emergence of a lower wavenumber 2D peak component, with the concurrent disappearance of the higher wavenumber 2Dþ peak component during oxidation of the catalyst surface. The 2D peak characteristics can therefore act as an unambiguous predictor of the success of the transfer. The combined monitoring and transfer process presented here is highly scalable and amenable for roll-to-roll processing.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, Nanocarbon, Center for Nanostructured Graphene, University of Cambridge, AIXTRON, Leibniz-Institut für Oberflächenmodifizierung e.V.
Pages: 75-81
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Carbon
Volume: 117
ISSN (Print): 0008-6223
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 6.76 SJR 2.226 SNIP 1.666
Web of Science (2017): Impact factor 7.082
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 6.49 SJR 2.091 SNIP 1.648
Web of Science (2016): Impact factor 6.337
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 6.53 SJR 1.988 SNIP 1.71
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 6.62 SJR 2.132 SNIP 1.976
Web of Science (2014): Impact factor 6.196
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 6.54 SJR 2.289 SNIP 2.114
Web of Science (2013): Impact factor 6.16
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 5.95 SJR 2.518 SNIP 2.102
Web of Science (2012): Impact factor 5.868
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 5.23 SJR 2.193 SNIP 2.048