Black silicon maskless templates for carbon nanotube forests - DTU Orbit (07/01/2019)

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We present here a proof of concept for a novel fabrication method of vertically aligned carbon nanotube forests, utilizing black silicon nanogras (a forest of silicon nanometer-sized spikes created with reactive ion etching) coated with titanium tungsten diffusion barrier as a template. The method allows maskless definition of carbon nanotube forests with control of their density, nanotube diameter and height. Four nanogras reactive ion etching recipes are investigated and their wafer-to-wafer repeatability, wafer uniformity, and density control is discussed. Evaluation of carbon nanotube forests grown on the nanogras substrates is presented with discussion of their morphology, diameter distribution, and catalyst thickness influence.

General information
State: Published
Organisations: Department of Micro- and Nanotechnology, Nanoprobes, Molecular Windows, Nanointegration, Imperial College London
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Pages: 110-113
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Microelectronic Engineering
Volume: 104
ISSN (Print): 0167-9317
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 1.87 SJR 0.604 SNIP 0.937
Web of Science (2017): Impact factor 2.02
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.69 SJR 0.589 SNIP 0.949
Web of Science (2016): Impact factor 1.806
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 1.35 SJR 0.507 SNIP 0.796
Web of Science (2015): Impact factor 1.277
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 1.44 SJR 0.586 SNIP 0.86
Web of Science (2014): Impact factor 1.197
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 1.45 SJR 0.595 SNIP 0.964
Web of Science (2013): Impact factor 1.338
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 1.44 SJR 0.737 SNIP 0.949
Web of Science (2012): Impact factor 1.224
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 1.8 SJR 0.813 SNIP 1.148
Web of Science (2011): Impact factor 1.557
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes