Visualizing the mobility of silver during catalytic soot oxidation

The catalytic activity and mobility of silver nanoparticles used as catalysts in temperature programmed oxidation of soot:silver (1:5 wt:wt) mixtures have been investigated by means of flow reactor experiments and in situ environmental transmission electron microscopy (ETEM). The carbon oxidation temperature was significantly lower compared to uncatalyzed soot oxidation with soot and silver loosely stirred together (loose contact) and lowered further with the two components crushed together (tight contact). The in situ TEM investigations revealed that the silver particles exhibited significant mobility during the soot oxidation, and this mobility, which increases the soot/catalyst contact, is expected to be an important factor for the lower oxidation temperature. In the intimate tight contact mixture the initial dispersion of the silver particles is greater, and the onset of mobility occurs at a lower temperature which is consistent with the lower oxidation temperature of the tight contact mixture. (C) 2015 Elsevier B.V. All rights reserved.

General information
State: Published
Organisations: Center for Electron Nanoscopy, Department of Chemical and Biochemical Engineering, CHEC Research Centre, Department of Physics, Center for Individual Nanoparticle Functionality
Contributors: Gardini, D., Christensen, J. M., Damsgaard, C. D., Jensen, A. D., Wagner, J. B.
Pages: 28-36
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Applied Catalysis B: Environmental
Volume: 183
ISSN (Print): 0926-3373
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 10.92 SJR 3.152 SNIP 2.359
Web of Science (2017): Impact factor 11.698
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 8.86 SJR 2.693 SNIP 2.185
Web of Science (2016): Impact factor 9.446
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 7.72 SJR 2.326 SNIP 2.16
Web of Science (2015): Impact factor 8.328
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 6.92 SJR 2.322 SNIP 2.206
Web of Science (2014): Impact factor 7.435
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 6.42 SJR 2.391 SNIP 2.154
Web of Science (2013): Impact factor 6.007
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 6.08 SJR 2.65 SNIP 2.234
Web of Science (2012): Impact factor 5.825
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 6.14 SJR 2.606 SNIP 2.351
Web of Science (2011): Impact factor 5.625
ISI indexed (2011): ISI indexed yes