Supporting Information

Nonuniform Functional Group Distribution of Carbon Nanotubes Studied by Energy Dispersive X-ray Spectrometry Imaging in SEM

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**Figure S1.** SEM images of as-grown super-growth SWCNT forests.
Figure S2. SEM-EDS images of KMnO₄/H₂SO₄ buckypaper at (a) low magnification (x350). A forest-like structure appears in the O/C image. (b) corresponds to an expanded view the area inside the yellow dashed line in (a) at a magnification of x 1,000.
Figure S3. SEM image of KMnO$_4$/H$_2$SO$_4$-treated SWCNTs transferred onto Si substrate.
Figure S4. EDS spectra from (a) Si, (b) Au, and (c) Si$_3$N$_4$ substrate. The inset tables indicate normalized intensities of C and O components from each corresponding substrate. By using a Si$_3$N$_4$ substrate, oxygen generation is much suppressed as low as < 0.1 atm%.
**Figure S5.** Monitoring the SEM measurement of SWCNT on Si$_3$N$_4$ substrate (a) without and (b) with a patterning metal microarray. (a) Significant imaging drift was observed due to the effect of charging by electron-beam irradiation. (b) Drift is suppressed by using a metal microarray during 1 hour of observation.
Figure S6. EDS images of SWCNT bundle structures on metal-microarray/Si$_3$N$_4$ substrate. The results are for SEM, C, Si, Au, O, and N. The left figure indicates the obtained EDS spectrum.
Figure S7. Result of line profile analysis of EDS imaging with (a) a metal-microarray on Si$_3$N$_4$ substrate (Figure 4d) and a Si substrate (Figure 4b). The estimated S/N ratio of imaging contrast are also listed. Here, we defined the S/N ratio as signal intensity divided by noise intensity.
Figure S8. EDS imaging results with metal-microarray/Si$_3$N$_4$ substrate for each SWCNT sample.