Abstract Submitted
for the GEC14 Meeting of
The American Physical Society

Interactions between plasma-treated carbon nanotubes and electrically neutral materials DAISUKE OGAWA, KEIJI NAKAMURA, Chubu University — A plasma treatment can create dangling bonds on the surface of carbon nanotubes (CNTs). The dangling bonds are so reactive that the bonds possibly interact with other neutral species even out of the plasma if the lifetime of the bonds is effectively long. In order to have good understandings with the interactions, we placed multi-wall CNTs (MWCNTs) in atmospheric dielectric barrier discharge that was created in a closed environment with the voltage at 5 kV. We set 50 W for the operating power and 15 minutes for the process time for this plasma treatment. Our preliminary results showed that the reaction between dangling bonds and neutrals likely occurred in the situation when CNTs were treated with argon plasma, and then exposed in a nitrogen-rich dry box. We did Fourier transform infrared (FTIR) spectroscopy after the treatments. The measurement showed that the spectrum with plasma-treated CNTs was different from pristine CNTs. This is an indication that the plasma-treated CNTs have reactive cites on the surface even after the discharge ($\sim$ minutes), and then the CNTs likely reacted with the neutral species that causes the different spectrum. In this poster, we will show more details from our results and further progresses from this research.

Daisuke Ogawa
Chubu University

Date submitted: 13 Jun 2014 Electronic form version 1.4