

Abstract Submitted
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Comparison of Upright Carbon Nanotwists Treated by Plasma with Different Types of Gases YOSHIYUKI SUDA, YUKI SUGIOKA, HIROFUMI TAKIKAWA, HIDETO TANOUE, Toyohashi University of Technology, HITOSHI UE, Tokai Carbon, Co., Ltd., KAZUKI SHIMIZU, Shonan Plastic Mfg. Co., Ltd., YOSHITO UMEDA, Toho Gas Co., Ltd. — Carbon nanotwist (CNTw) is a kind of helical carbon nanofiber and a good candidate for field emission material as well as carbon nanotube. We have used CNTws as a base material of field emitter (FE). CNTws were synthesized by catalytic chemical vapor deposition [1]. The CNTw paste was prepared by mixing CNTw with an organic binder. The CNTw FE was fabricated by screen-printing the paste on substrates. Then, the FE surface was treated with plasma. A quartz plate was glued on both electrode surfaces of the plasma reactor. A glow discharge was generated uniformly in He gas, and dielectric barrier discharge (DBD) was generated in N₂ gas. Three effects on the CNTw dots by DBD are shown as follows: (i) making CNTws stand up, (ii) relocation of CNTws, and (iii) etching of CNTws. By contrast, the three effects were not obtained by glow discharge. Luminescence from phosphor on the anode of the CNTw FE treated by DBD for 30 s was uniform. FE characteristics were improved by an increase of upright CNTws [2].

[1] Y. Hosokawa, et al, *Res. Lett. Mater. Sci.*, **2007**, 59167, 2007

[2] Y. Hosokawa, et al, *J. Phys. D: Appl. Phys.*, **41**, 205418, 2008

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