

Abstract Submitted  
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**Highly Efficient Field Emission from Carbon Nanotube-Nanohorn Hybrids Prepared by Chemical Vapor Deposition** RYOTA YUGE, NEC Corporation, JIN MIYAWAKI, Japan Science and Technology Agency, TOSHINARI ICHIHASHI, SADANORI KUROSHIMA, TSUTOMU YOSHITAKE, NEC Corporation, TETSUYA OHKAWA, YASUSHI AOKI, NEC Lighting, Ltd., SUMIO IJIMA, Meijo University, MASAKO YUDASAKA, National Institute of Advanced Science and Technology — It is reported that the carbon nanotube (CNT) is one of the best cold cathode emitters for field emission display (FED) and field emission lamp (FEL) due to their large aspect ratio, high mechanical strength, and high electrical conductivity. For the manufacture of highly efficient field emission (FE) devices, we synthesized single-wall carbon nanotube (SWNT) on catalyst-supported single-wall carbon nanohorn (SWNH). We incorporated Fe acetate into SWNHs, heat-treated them, and obtained Fe oxide nano-particles attached to the tips of SWNHs (Fe@NHox). Using Fe@NHox as the catalyst, SWNTs were grown by ethanol-CVD technique (NTNH). In the obtained NTNH, the SWNTs diameters were 1–1.7 nm and the bundle diameters became almost uniform, *i.e.*, less than 10 nm, since the SWNTs were separated by SWNH aggregates. We also confirmed that a large-area FE device with NTNH cathodes made by screen printing was highly and homogeneously bright, suggesting the success of the hybrid strategy.

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