

## **Improvement of electron field emission from carbon nanotube film by neutral beam treatment**

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In this study, to improve the field emission properties of screen printed CNT films as one of the surface treatment technique, Ar neutral beam was used and its properties were investigated. Neutral beam plasma treatment on tape-activated CNTs enhanced the emission properties of the CNTs showed a decrease in turn-on field and an increase in emission sites after the treatment. The neutral beam treatment appeared to render the CNT surfaces more actively by exposing more CNTs from the CNT paste without cutting or kinking the already exposed long CNT emitters. When the field emission properties were measured, the turn on electric field ( $E_{to}$ ) after ion beam treatment increased from 1.74 to 2.77 V/ $\mu\text{m}$  but the turn on field after neutral beam treatment decreased from 1.74 to 0.94 V/ $\mu\text{m}$ . we expect that the neutral beam plasma treatment introduced in this study will provide easy way to improve emission uniformity and emission intensity