Transworld Research Network
37/661 (2), Fort P.O.
Trivandrum-695 023
Kerala, India

Industrial Application of Plasma Process, 2009: 15-23 ISBN: 978-81-7895-457-8 Editor: Shunjiro Ikezawa

3. Rearrangement of twisted carbon nanofibers by filamentary discharge treatment in N_2 gas

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Abstract. Filamentary discharge was applied to screen-printed twisted carbon nanofiber (carbon nanotwist, CNTw) field emitter for surface treatment using dielectric barrier discharge apparatus. The effects of surface treatment on CNTw by a glow discharge using He gas and a filamentary discharge using Ar, Air, N_2 gases were evaluated. It was observed that the filamentary discharge breaks the CNTw agglomeration on the printed CNTw pattern and rearranges CNTw outside of the printed area. N_2 gas worked to rearrange CNTw uniformly, compared with Ar and Air. As the flow rate of N_2 gas increased, the number of rearranged CNTw increased in the direction of gas flow. By this result, it is concluded that the rearranged CNTws were transported by gas flow. The rearranged CNTws were made to stand up and their length was shortened with an increase of the treatment time.

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