

Abstract Submitted
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Low-energy dark discharge growth of ultra-thin aligned carbon nanofibers for field emitter and optical antenna arrays¹ YANG WANG, Boston College, K. KEMPA, Boston College, Z. F. REN, Boston College, DEPT. OF PHYS., BOSTON COLLEGE TEAM — We show experimentally the applicability of using a dc low-energy dark discharge state to grow aligned carbon nanofibers with diameters of less than 10 nm and directly on polyimide and transparent conducting oxides without buffer layers. The average discharge current density used can be 2-3 orders of magnitude lower than that in a typical plasma-enhanced chemical vapor deposition (PECVD), so that the plasma heating and etching effects are greatly alleviated, leading to lower growth temperatures and higher substrate compatibility. The nanofibers grown by dark discharges exhibit similar optical antenna effects to those grown by PECVD methods, and their diameter and density can be reduced to achieve good field emission properties.

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