

Supporting information for:

Patterned arrays of vertically aligned carbon nanotube microelectrodes on graphitic carbon films prepared by thermal chemical vapor deposition

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Figure S1: Procedure for patterning Al/Fe catalyst spots on PPF using electron beam
lithography (EBL);

and

Description of procedure for patterning pyrolyzed photoresist film (PPF) substrate
with Al/Fe catalyst spots using electron beam lithography (EBL).

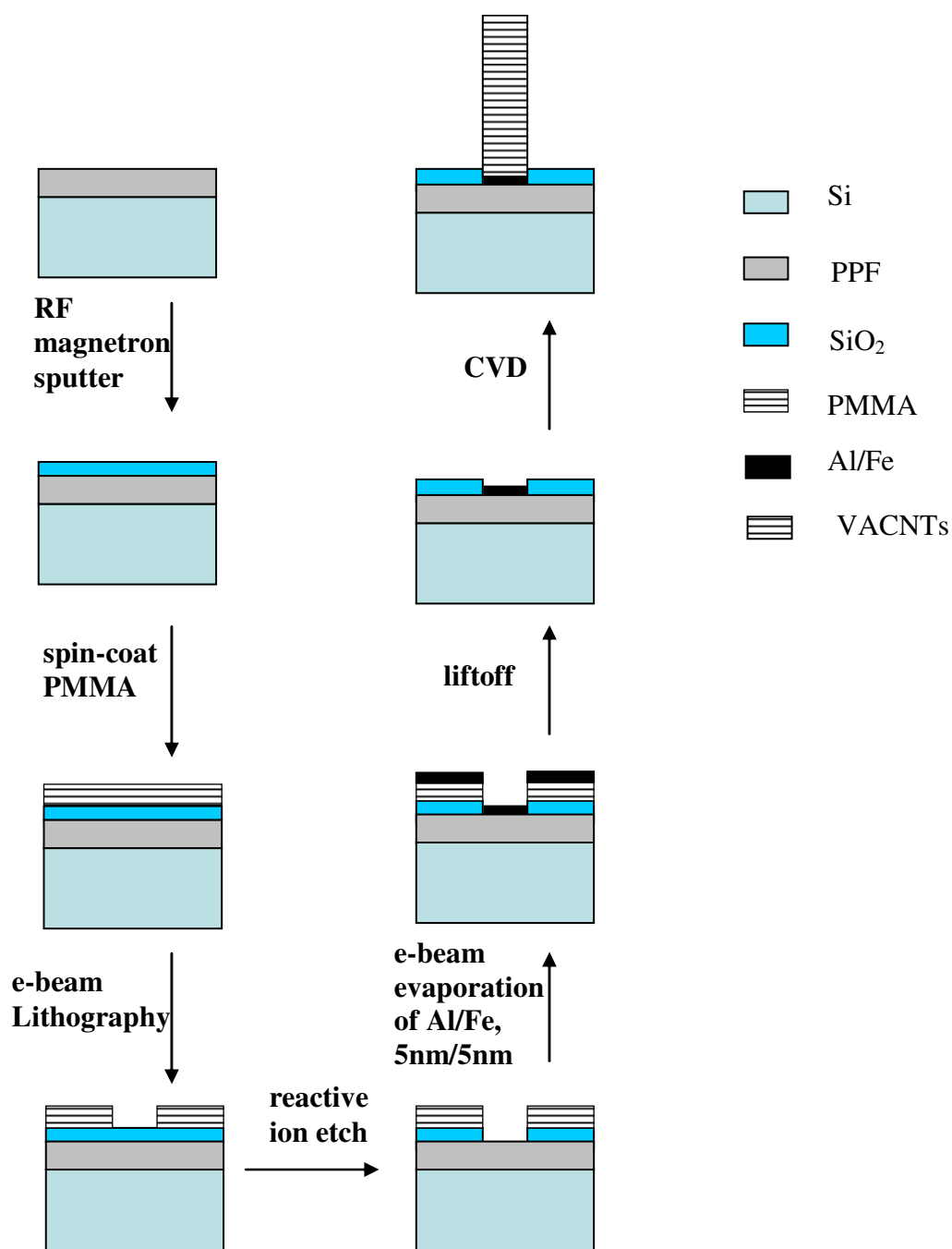


Figure S1. Procedure for patterning Al/Fe catalyst spots on PPF using electron beam lithography (EBL)

Procedure for patterning the substrate prior to deposition of Al and Fe catalyst layers. A thin layer (~ 40 nm, measured with a Dektak II profilometer) of SiO₂ was deposited on PPF using a radio frequency (RF) magnetron sputterer in Ar plasma (4.2×10^{-3} Torr, 10 min, 200 W, 10 sccm). Approximately 360 nm of

polymethylmethacrylate (PMMA) in *o*-xylene was spin-coated on the SiO₂-PPF substrate. The samples were pre-baked at 180 °C for 1.5 min on a hotplate. The PMMA was patterned using electron beam lithography (EBL), conducted at an acceleration voltage of 20 keV with an electron beam dosage of 250 $\mu\text{C}/\text{cm}^2$. The patterned PMMA was developed in 1:3 methyl isobutyl ketone : isopropanol for 30 s, and the samples were post-baked on a hotplate at 100 °C for 2 min. After removing PMMA residues from the patterned areas (O₂ plasma, 15 s), exposed SiO₂ was removed using reactive ion etching (RIE, Plasmalab 80plus, Oxford Instruments) in a CHF₃/Ar (50 sccm/15 sccm) mixture at -25 °C. The plasma was applied at 200 W with a pressure of 0.03 Torr for 1 min.

The purpose of the SiO₂ layer in the above procedure, was to prevent direct contact between PMMA and PPF. When PMMA was deposited directly on PPF, it could not be completely removed during developing.