

Supplementary information.docx

Self-templated Non-catalyzed Synthesis of Monolithic BN nanowires

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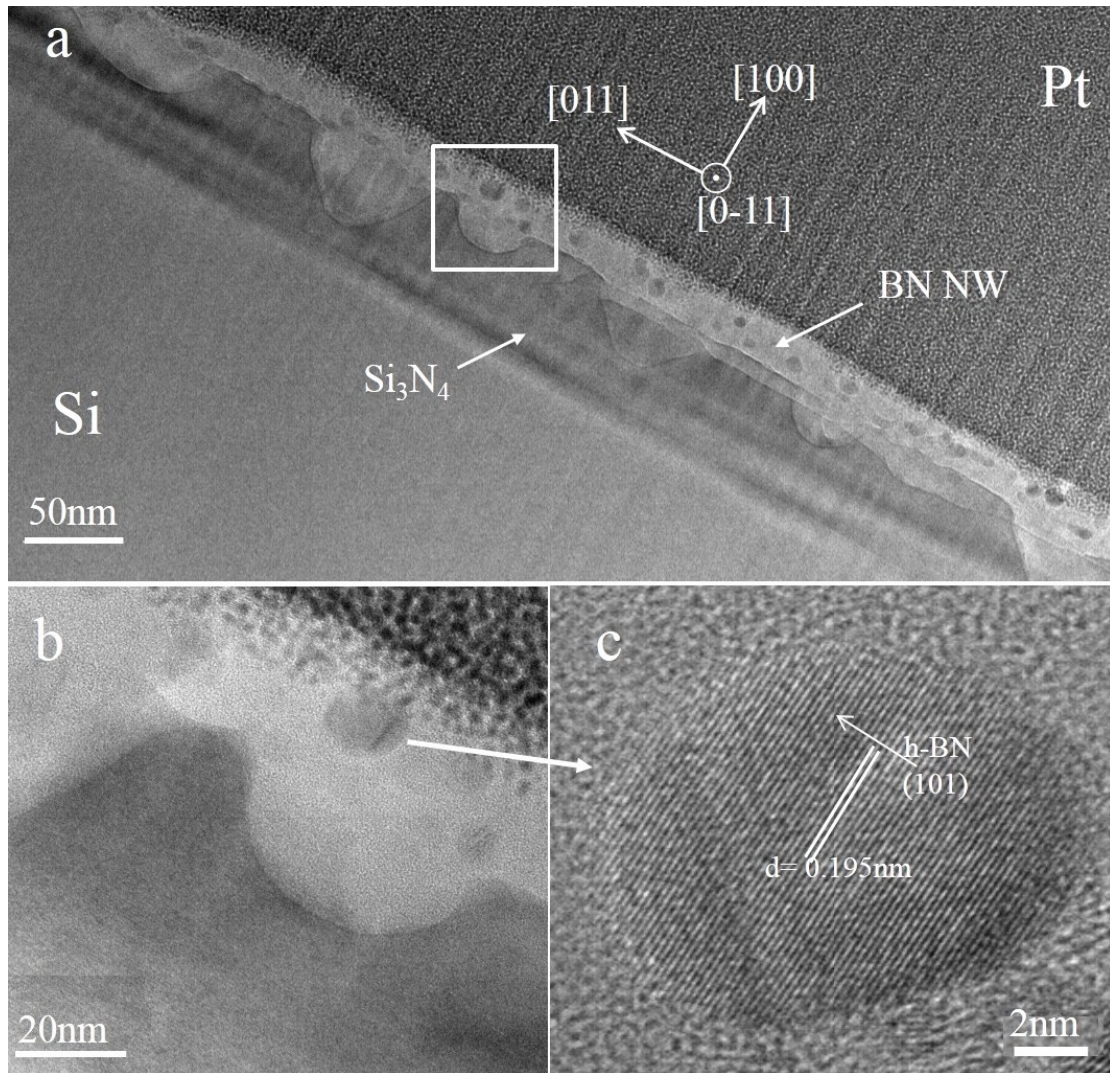


Figure S1 (a) TEM micrograph of the BN nanowire along the axial direction, there are many crystalline grains in the amorphous nanowire. (b) Partly enlarge TEM micrograph of the nanowire. (c) The crystalline grains contained within the amorphous nanowire are turned out to be h-BN.

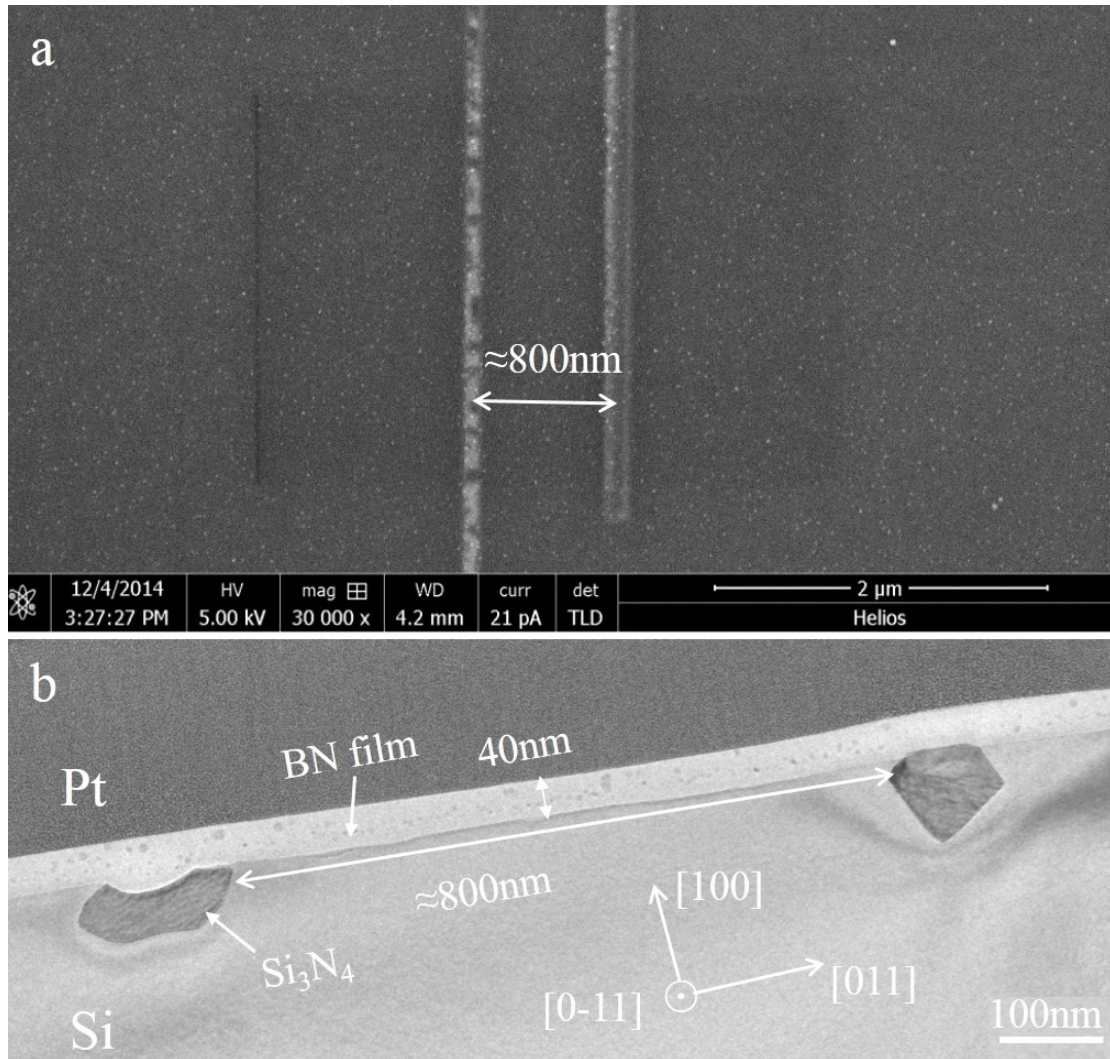


Figure S2 (a) SEM micrograph of the two parallel nanowires on Si(100). (b) Cross-sectional TEM micrographs of the two parallel nanowires. It clearly shows that a ~40 nm thick amorphous thin film is epitaxial growth on the substrate and the NWs growth exactly above the endotaxial Si₃N₄.

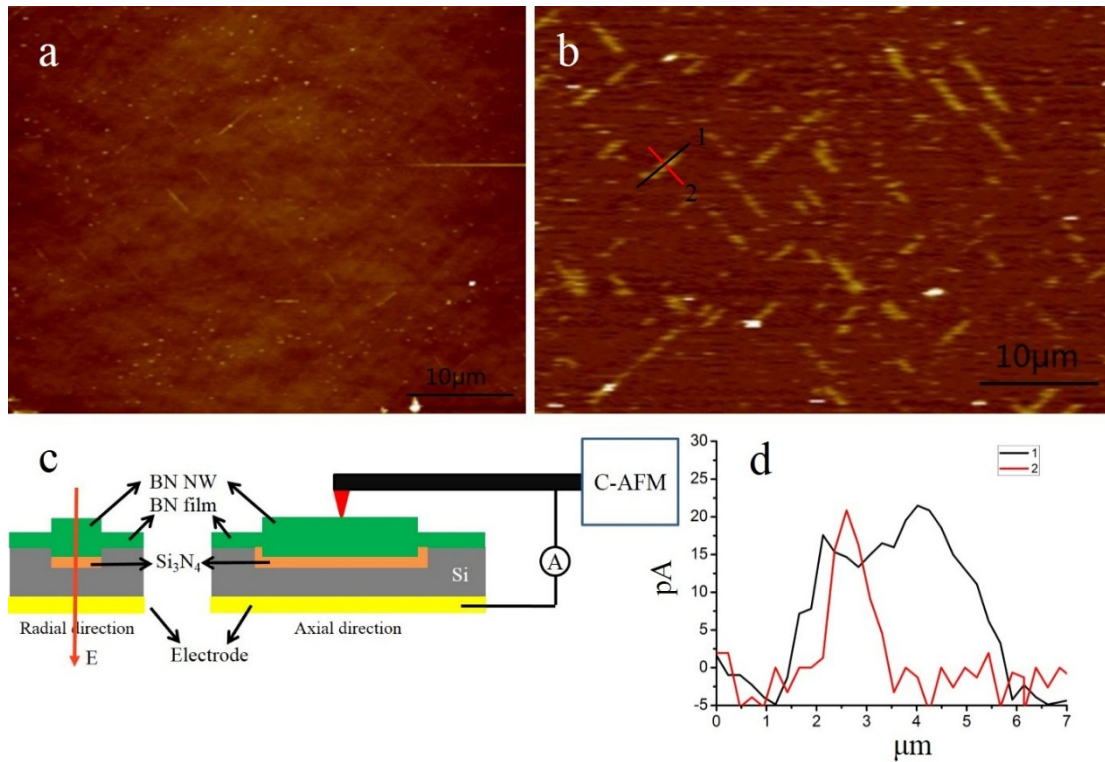


Figure S3 (a) Topography AFM and (b) conductance AFM images of the BN nanowires growth on Si(100). Conductance AFM image of (b) was acquired using a tip bias of 9V. (c) Schematic picture of measurement set-up in C-AFM. (d) Current profile along the line in (b), the maximum current is ~ 20 pA. Combining with (a) and (b), the current through the nanowire is larger than other areas. It means that the BN-Si₃N₄-Si heterostructure and BN-Si heterostructure seems to present a different electrical performance, which provide a possibility for the special structure apply to fabricate nano-scale device. Such as to fabricate memorizer device: “BN-Si” correspond to signal “0”; “BN-Si₃N₄-Si” correspond to signal “1”.