Supporting Information for

Structural transformation of h-BN overlayers on Pt (111) in oxidative atmospheres

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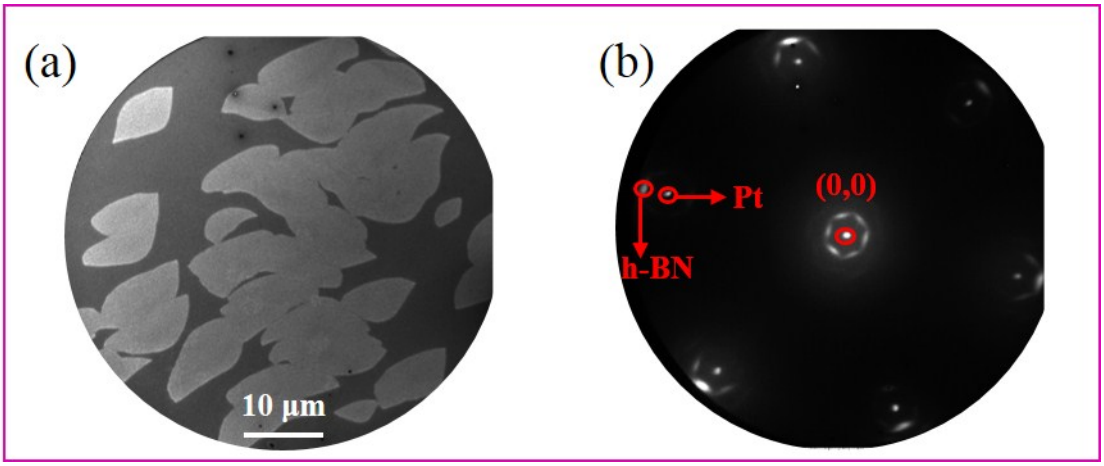


Figure S1. Growth of h-BN domains on Pt(111). (a) LEEM image and (b) LEED pattern (50 eV) of h-BN domains grown on Pt(111). The Pt(111) surface was exposed to 5×10^{-8} Torr borazine at 800 ^{o}C for 20 min. The start voltage is 1.5 V.

Within sub-monolayer coverage, monolayer h-BN islands form with the domains size around 20 µm and micro-region low energy electron diffraction (µ-LEED) measurements made on the different domains show the same satellite diffraction spots characteristic, indicating that there is only one orientation of h-BN overlayer with respect to the Pt(111) surface

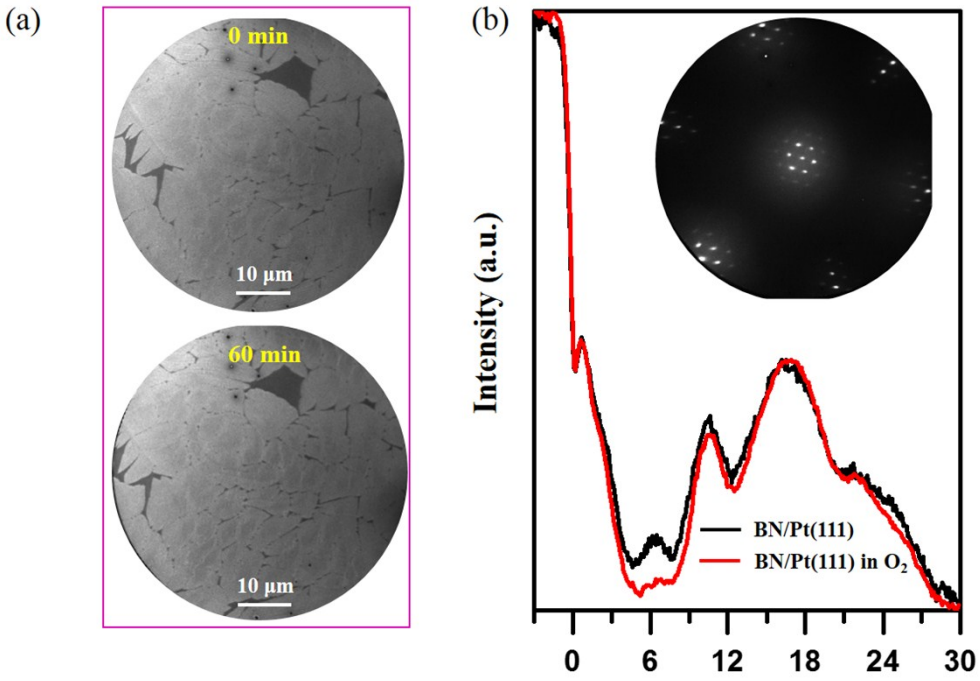
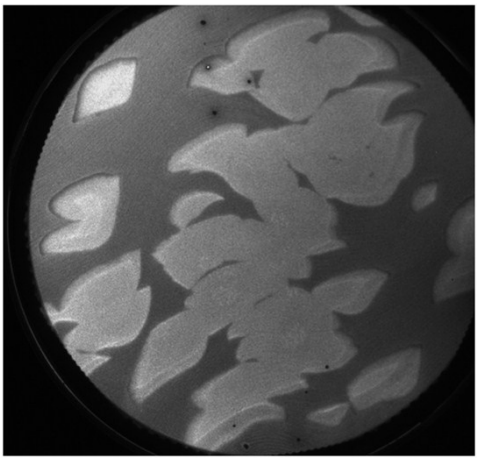
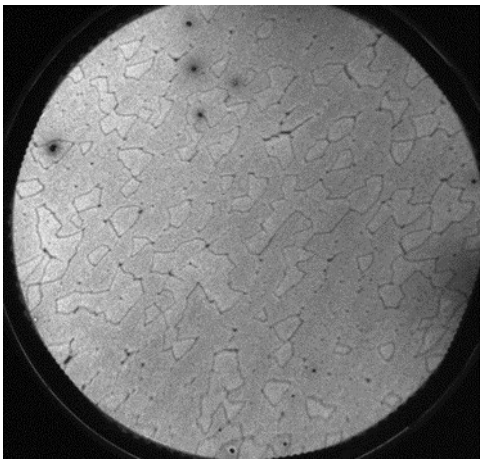


Figure S2. (a) LEEM images and (b) I-V curves acquired before and after the full layer h-BN/Pt(111) surface exposure to 1 × 10^{-6} Torr O_2 at 400 °C for 60 mins. The start voltage is 2.0 V. The inset is the µ-LEED pattern acquired from O_2-treated h-BN/Pt(111) surface.

LEEM images show that the full h-BN layer remains unchanged when treating in 1 × 10^{-6} Torr O_2 at 400 ˚C °C for 60 mins. I-V curves and LEED patterns recorded from the surfaces before and after the treatment are nearly identical. These results elucidate that the full layer h-BN cannot be intercalated by oxygen, which is in contrast with the facile intercalation and oxidation of h-BN islands under the same condition.



Video S1 LEEM video of h-BN islands oxidized in O_2. Oxidation conditions: temperature = 400 ^{o}C, P(O_2) = 1 × 10^{-6} Torr. Image conditions: STV = 2.0 V, FOV = 50 μm. The whole oxidation process lasted for 21min.



Video S2 PEEM video of full layer h-BN intercalated in NO_2. Intercalation conditions: temperature = 140 ^{o}C, P(NO_2) = 5 × 10^{-7} Torr. Image conditions: FOV = 50 μm. The whole oxidation process lasted for 2 min 30 s.