Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supplementary Information

Epitaxial chemical vapour deposition growth of monolayer hexagonal boron nitride on Cu(111)/sapphire substrate

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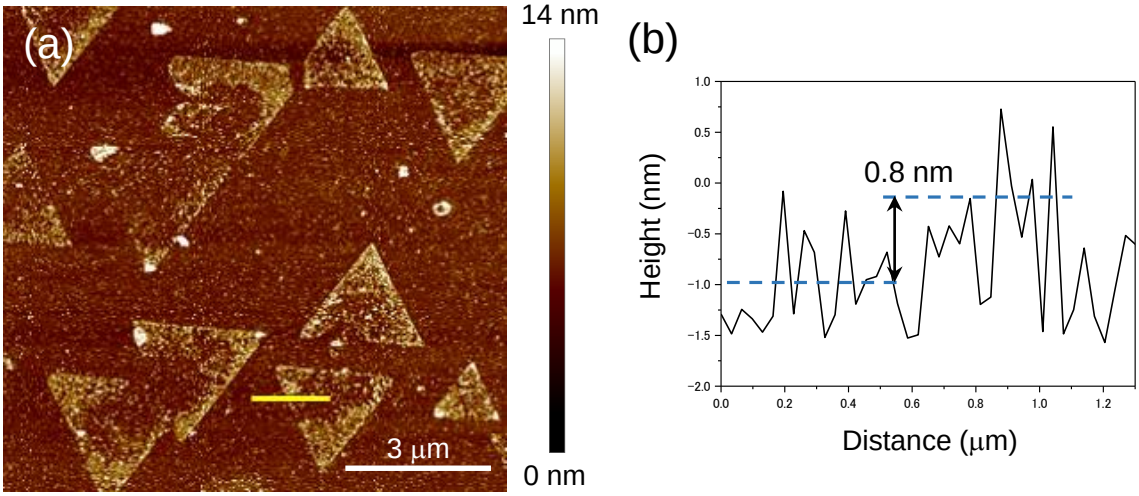

Fig. S1. (a) AFM image of triangular h-BN grains transferred on a SiO_2 substrate. (b) Height profile of a h-BN grain measured along the yellow line shown in (a).

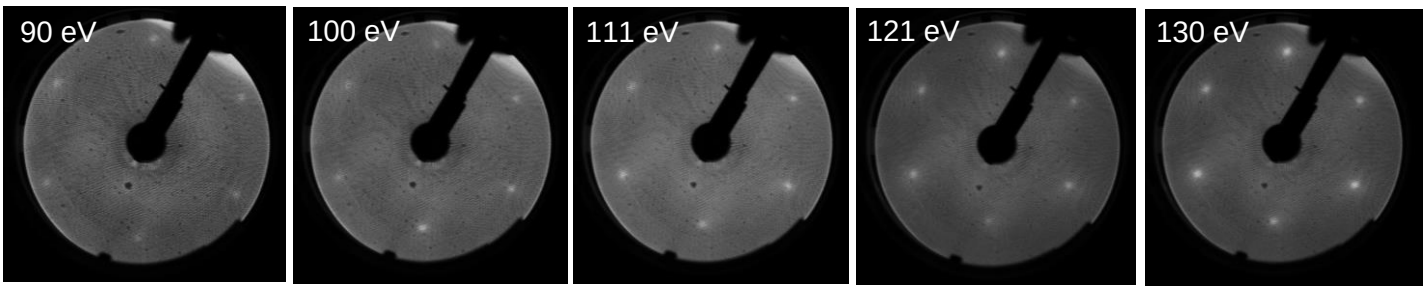

Fig. S2. LEED patterns of as-grown h-BN films on Cu(111)/sapphire substrates, collected with different electron energies.

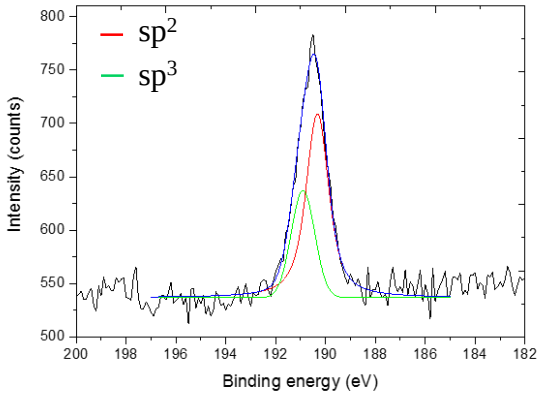

Fig. S3. XPS B_{1s} spectra of as-grown h-BN sheets. The peak is fitted with two Gaussian-Lorentzian mixed curves (Voigt function) which correspond to B atoms with sp^2 (~190.5 eV) and sp^3 (~191.1 eV) hybridized orbitals. We used the intensity of the sp^2 component to determine the [B]:[N] atomic ratio listed in Fig. 4, because only sp^2-B atoms contribute to the h-BN formation. Excess sp^3-B atoms may exist in the subsurface of Cu(111) and/or amorphous B at the interface between h-BN and Cu substrate.

Table S1. Fitting parameters used in Fig. S3.

	Peak position (eV)	Percentage of peak area (%)
sp^2	190.3	69
sp^3	190.9	31

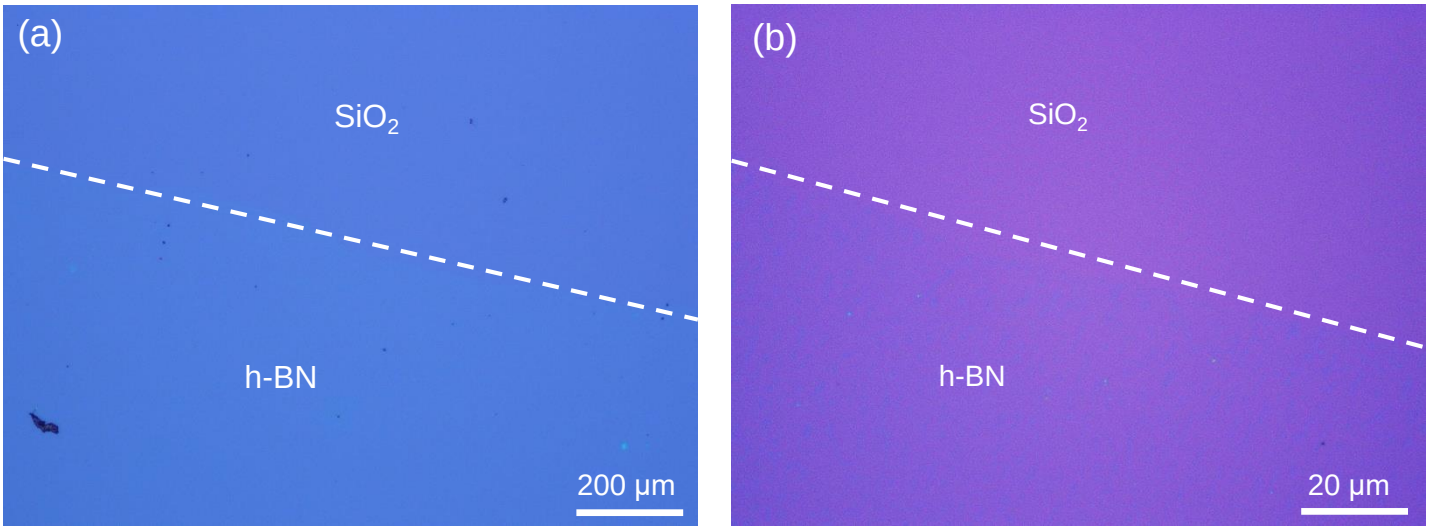

Fig. S4. Optical micrograph of monolayer (a) and multilayer (b) h-BN films which were transferred on SiO_2/Si substrates (SiO_2 thickness is 300 nm). Image (a) indicates that monolayer h-BN is difficult to be observed by an optical microscope. However, the edge was slightly recognized due to the presence of PMMA residue which was used to transfer the h-BN.

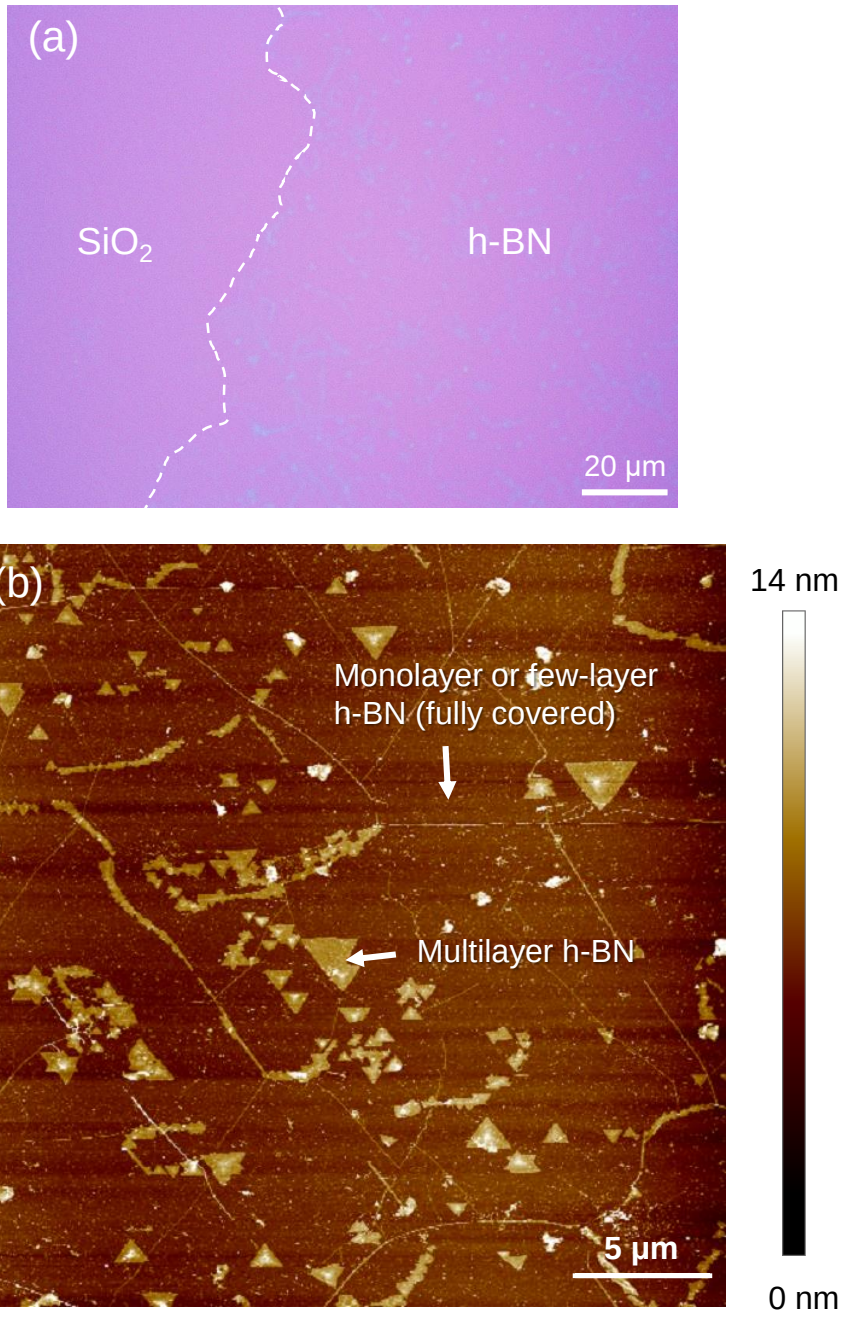

Fig. S5. (a) Optical microscope image of multilayer h-BN transferred on a SiO_2/Si substrate. (b) AFM image of the multilayer h-BN sheet. Here, monolayer or few-layer h-BN fully covers the Cu surface.

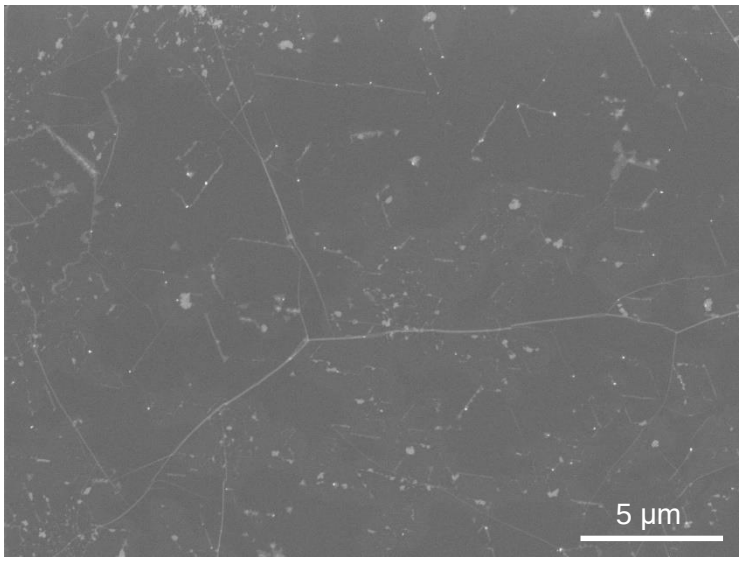

Fig. S6. SEM image of as-grown h-BN film on Cu(111) surface. Wrinkles are observed in the as-grown film .