

Effect of metal deposition on atomically h-BN

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Abstract

Metal deposition is a standard process in semiconductors industry to fabricate electronic devices. However, it has been suggested that electron beam evaporation of metals can damage the surface of two-dimensional (2D) layered materials, producing partial local etching and resulting in multiple dangling bonds that can reduce the performance of the devices. However, how the effect of metal deposition will influence h-BN has never been studied. Here we present statistical analyses that compare the effect of metal deposition (electron beam evaporation and sputtering) on multilayer hexagonal boron nitride (h-BN) produced by mechanical exfoliation and metal organic chemical vapour deposition (MOCVD) h-BN. Our experiments indicate that both deposition methods damage the surface of the h-BN, as the h-BN protected with materials deposited at low energy (e.g. spin-coated photoresist, inkjet printed metals and transferred electrodes) do not exhibited this damage.