Silicene, a 2D honeycomb lattice consisting of Si atoms, becomes one of the feasible materials for future nanodevices. The charge carriers in the freestanding single layer silicene are recognized as Dirac fermions. Nowadays silicene can be successfully fabricated on Ag(111) substrate. However, when single layer silicene is synthesized on Ag(111) surface, the Dirac fermion characteristics vanish due to substrate-induced symmetry breaking. No Landau level sequences appear in the tunneling spectra under the magnetic field up to 7T, and density functional theory calculations show that the electronic structure is drastically modified by the hybridization between the Si and Ag atoms. For bilayer silicene, the STS mapping showed a parabolic band across the Fermi level, which can be assigned to the Si-modified silver electronic band. Both results suggest that it is required avoiding the substrate interaction for unraveling the intrinsic property of silicene.

参考文献
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