

Progress in single layer silicene functionalization and in multilayer germanene growth

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Abstract

Silicene and germanene are emergent novel artificial two-dimensional (2D) materials that might rival graphene for logic applications in electronics [1]. Silicene has attracted enormous interest since 2012 after publication of our seminal paper on the epitaxial synthesis of the archetype 3 x 3 reconstructed monolayer silicene phase in perfect coincidence with a 4 x 4 cell on a silver (111) substrate [2]. Just recently, ordered and reversible hydrogenation of this phase has been achieved, first in Beijing [3], next at the PIIM Lab in Marseille, where high resolution spectroscopic results have been added [4]. Strikingly, the first silicene FET with ambipolar characteristics has been fabricated [5]. We have also synthesized multilayer silicene, which is self-protected in ambient air, on a silver template [6] and single layer germanene, predicted to be a robust 2D topological insulator at nearly room temperature, on a gold substrate [7]. Few months later, single phase monolayer germanene was synthesized in Mulhouse on an aluminum one at just 80°C [8]. In my talk, I will summarize those results and present new results on multilayer germanene [9].

References

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