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Hybrid graphene-catalyst nanostructures: elucidating the nature of the interface¹ GEORGI DIANKOV, JIHWAN AN, JOONSUK PARK, FRITZ PRINZ, DAVID GOLDHABER-GORDON, Stanford University — There has been intense research into developing and characterizing new electrochemically active materials consisting of nanosized catalysts and thin films on various substrates. The desirable characteristics of nanoscale catalysts, such as low mass loading, high efficiency and chemical stability, directly depend on the atomic-scale nature of the interface between the catalyst particles and their substrates. We synthesize and characterize one such model interface, that between high-quality graphene surfaces and Pt nanocrystals grown directly on the graphene. We observe an atomically sharp interface and a high degree of crystalline order. In particular, we analyze the chemical nature of the interface with probe-corrected STEM-EELS at 80 kV and aim to understand the chemical nature of the interface. The study points to novel ways of engineering interfaces for nanocatalysis.

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