

Abstract Submitted
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Intercalation of metal islands and films at the interface of epitaxially grown graphene and Ru(0001) surfaces¹ LI HUANG, YI PAN, LIDA PAN, MIN GAO, WENYAN XU, YANDE QUE, HAITAO ZHOU, YELIANG WANG, SHIXUAN DU, HONGJUN GAO, Institute of Physics, Chinese Academy of Sciences, INSTITUTE OF PHYSICS, CHINESE ACADEMY OF SCIENCES TEAM — Epitaxial graphene on Ru(0001) provides a high quality adlayer, but has a strong interaction with the substrate. This interaction can be effectively weakened via intercalating a layer of other element between epitaxial graphene and its substrate. In this work, we intercalated seven kinds of metals including noble metals Pt, Pd and Au, magnetic metals Ni and Co, a IIIA group metal In and a rare earth metal Ce, at the interface of epitaxially grown graphene and Ru(0001), to show the universality of metal intercalations in this system. These metals form different intercalated structures that have different impacts on the corrugation of graphene. Atomic resolution images of a perfect graphene lattice on the intercalated structures can always be obtained, which confirms that the intercalation of these metals is a non-damaging process. Additionally, based on primary DFT calculations, we propose a model involving metal-atom-aided-defect and self-healing of C-C bonds at high temperature, which can well explain the intercalation process of some metals and provide the potential to better understand the intercalation mechanism.

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