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Theory of the Growth of Epitaxial Graphene on Close-Packed Metals ANDREW ZANGWILL, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, DIMITRI VVEDENSKY, Blackett Laboratory, Imperial College, London SW7 2BZ, UNITED KINGDOM — We present a simple rate theory of epitaxial graphene growth on close-packed metals. Motivated by recent low-energy electron microscopy experiments [E. Loginova, N.C.Bartelt, P.J. Feibelman, and K.F. McCarty, New Journal of Physics, **10**, 093026 (2008)], our theory supposes that graphene islands grow predominantly by the addition of five-atom clusters, rather than solely by the capture of diffusing carbon atoms. With suitably chosen kinetic parameters, we find quantitative agreement with (i) the measured time-evolution of the adatom density and (ii) the measured temperature-dependence of the adatom density at the onset of nucleation by assuming that the smallest stable precursor to graphene growth is an immobile island composed of six five-atom clusters.

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