Metal intercalation-induced selective adatom mass transport on graphene

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— Using first-principles calculations, we show that partially intercalated graphene, with a mixture of intercalated and pristine areas, can induce an alternating electric field because of the spatial variations in electron doping, and thus, an oscillatory electrostatic potential. This alternating field can change normal stochastic adatom diffusion to biased diffusion, leading to selective mass transport and consequent nucleation, on either the intercalated or pristine areas, depending on the charge state of the adatoms.

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