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Doping of graphene nanomeshes by ion-chelation AHMED MAAROUF, IBM T.J. Watson Research Center & Egypt Nanotechnology Center, RAZVAN NISTOR, ALI AFZALI, MARCELO KURODA, DENNIS NEWNS, GLENN MARTYNA, IBM T.J. Watson Research Center — Graphene nanomeshes (GNM's) are formed by the creation of a superlattice of pores in graphene. Depending upon the pore shape, size, superlattice constant and symmetry, GNM's can be semimetallic, or semiconducting with a fractional eV band gap, allowing them to be fruitfully employed in applications that pristine graphene cannot. In this work, first principles calculations are used to study the doping of semiconducting GNM's using a chemically motivated approach. It is shown that *ion-chelation* leads to a stable doping of the GNM's, and that it occurs within a rigid band doping picture. Such chelated or "crown" GNM structures are thus stable, high mobility semiconducting materials which can serve as building blocks for novel graphene-based nanoelectronics applications.

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