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Polaron Formation in Graphene Nanoribbons IVO BATISTIC, University of Zagreb, Croatia, AVADH SAXENA, ALAN BISHOP, Los Alamos National Lab — The tight-binding SSH model, commonly used to describe trans- and cis-polyacetylene and other conducting polymers, can also be applied to study polaron formation in the recently synthesized graphene nanoribbons. Within the model we find that the stability of a polaron is strongly dependent not only on the type of the ribbon (armchair vs. zig-zag), but also on the ribbon width. The formation of polaron implies the existence of localized energy states within the electronic band and localized lattice deformation as well as localized phonon excitations. All these properties can be calculated within the SSH model, which in turn can be used as a reference for a comparison with experimental measurements on optical, electronic and transport properties of graphene nanoribbons with differing width and type.

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