

Abstract Submitted
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π -orbital theory for fractal models of bond-diluted graphene

WILLIAM SCHWALM, Univ of North Dakota, ALBERT SCHMITZ, Univ Colorado, Boulder — Fractal structures are glassy in the sense that detailed site environments are mostly different for different lattice sites. In view of recent interest in graphene and related carbon structures, we explore electronic properties in simple Hückel π -orbital theory for several fractal lattices, including one with a three-piece generator based on triphenylene, and one with a seven-piece generator based on coronene. A transfer matrix renormalization method applied to a pivotal subset of the Green functions gives exact recursions. From these we study properties including local DOS and Kubo-Greenwood conductance. The Green function renormalization recursions comprise a discrete dynamical system of iterated, rational functions. In some cases these recursions admit Lie groups and so reduce to simple form. The reduction method and some model properties are presented.

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