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Edge effect on Magnetic Phases of Doped Zigzag Graphone Nanoribbons

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Abstract

Curie temperature T_C has important implications for the experimental realization of magnetic graphone nanostructures relevant for future spintronic applications. Using both Monte Carlo method and mean field theory, we study magnetic properties of zigzag graphone nanoribons (ZGONR) doped with magnetic impurities M. We show that T_C increases with the number of dopants but for configurations with fixed number M, T_C is not very sensitive to impurities distances d(M-M). In particular, in bidoped ZGONR configurations, T_C has different values for the same d(M-M). This surprising behavior stems from edge effect. The result as derived in this report is easily adapted to predict how the magnetism is influenced in all half hydrogenated four-electrons hexagonal nonoribbon devices.

Keywords: Graphone, Nanoribbons, Monte Carlo, Mean Field Theory, Magnetic phases, Curie Temperature, Transition metals.

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