عنوان مقاله:

Oscillation of carbon nanosectors orbiting inside carbon nanotorus molecules

محل انتشار:

یازدهمین کنفرانس بین المللی علوم و توسعه فناوری نانو (سال: 1402)

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خلاصه مقاله:

In this paper, the continuum approximation along with the ۶-۱۲ Lennard-Jones potential function is employed to investigate the mechanics of carbon nanosectors orbiting inside carbon nanotorus molecules. Following the present method, a semi-analytical formulation is obtained in terms of double integrals which can be readily employed to attain the van der Waals interactions between two nanostructures. Moreover, a semi-analytical expression is introduced to evaluate the oscillation frequency of the proposed nano-oscillator. It is assumed that the nanosector is orbiting inside the nanotorus molecule and is free to select its preferred position inside this nanostructure. Numerical results are presented to examine the effects of geometrical parameters such as tube and ring radii of nanotorus as well as angle of nanosector on the distributions of potential energy, vdW interaction force and oscillation frequency. Interestingly, it is demonstrated that the oscillation frequency, which is in the gigahertz range, is independent of the sector angle. Results of this study are shown to be consistent with the existing data and can be beneficial for the future studies on .the high-frequency nano-oscillators

کلمات کلیدی:

Carbon nanosector, Carbon nanotorus, Continuum approximation, Van der Waals interactions, Oscillation frequency, .Nano-oscillators