



A NOVEL SYMMETRY IN NANOCARBONS: PRE-CONSTANT DISCRETE PRINCIPAL CURVATURE STRUCTURE

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In this paper, we have analyzed the geometrical structure of the configurations of carbon atoms in nanocarbons, C_{60} , carbon nanotubes, C_{60} dimer, and C_{60} -polymers (peanut-shaped fullerene polymers), determined by the first-principles calculations in terms of the discrete principal curvature based on the discrete differential geometry. While the C_{60} and nanotubes have the constant discrete principal curvature (CDPC), we demonstrate that the C_{60} -polymers and C_{60} dimer also have the almost constant (pre-constant) discrete principal curvature (pCDPC) with revolutionary symmetry due to discreteness, though constant principal curvature surfaces in a continuum picture are realized only by tubes and a sphere.

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Contents

1	Introduction	26
2	Mathematical Preliminary	28
3	Shapes of the C_{60}-Polymer Obtained Using the First-Principles Calculation	29
4	Geometrical Properties of the C_{60}-Polymers	30
5	Geometrical Properties of the Nanocarbons	33
6	Discussion	35
7	Conclusion	38
	References	41
	doi:10.7546/giq-27-2024-25-44	25