

Abstract Submitted
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Study on the Thermodynamic Stability of the Photovoltaic Cell Using Electro-mechanical and Physical Analysis ANDREW SUNG, SO MIN LEE, RICHARD KYUNG, CRG-NJ — An organic solar cell is a type of photovoltaic cell which produces electricity from sunlight by the photovoltaic effect. Conductive organic polymers are used for light absorption and charge the cell. Numerous studies validating the fullerenes potential to be used in the solar cell have led scientists to assess the safety of fullerene derivatives such as thermodynamic stability. This research uses computational method to study the thermodynamic stability of various fullerene derivatives and optical properties in the photoactive layer in organic solar cell. The research uses computational software to further display the optimized geometry energy levels and check electrical energy contour of solar cells. The Avogadro software is an open-source molecular editing program equipped with an auto-optimization feature, which determines the theoretical values of a certain structures atomic properties. Variables were quantified by their optimized energies, dipole moments, and electrostatic maps, respectively, after being modeled in the program. This software allows users to build virtually any nanoparticle and optimize its geometry according to various force field options.

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