Abstract Submitted
for the 4CS19 Meeting of
The American Physical Society

Study on the Organic Solar Cells to Improve Electrical Efficiency Using Physical and Computational Analysis JAEHONG MIN, RICHARD KYUNG, Choice Research Group — Researchers have been searching for an eco-friendly and sustainable energy source that can replace fossil fuels to alleviate the future energy crisis. Renewable solar cells have been identified as a potential solution for manufacturing miniaturized low-cost photovoltaic cell. In this research, organic materials such as fullerene analogs as electron acceptors were studied using computational and physical methods to increase the electric fields in the OSC (Organic Solar Cell) unit. Electric and thermodynamic properties of isotropic thin organic materials, such as optimized energy (kJ/mol) and dipole moment (debye), were calculated using a computational program. Furthermore, electrostatic potential maps were found and analyzed in the assessment of activity and stability of the OSCs for sustainable solar cell development. Specifically, this research focuses on increasing electric properties of solar batteries using different types of organic nanoparticles. To increase the stability of OSCs to store more energy efficiently, various combinations of C60 fullerene derivatives were tested to differ the structure of functional groups.

Jaehong Min
Choice Research Group

Date submitted: 12 Sep 2019 Electronic form version 1.4