# Impedance Spectroscopy on Polymer-Fullerene Solar Cells

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Impedance spectroscopy is used for studying the electrical transport properties of bulk heterojunction solar cells. A replacement circuit is needed to translate the frequency response of the circuit to the individual interfaces and layers of the solar cell. As a material combination and device architecture, composites of P3HT and PCBM, sandwiched between a transparent ITO front electrode and an aluminum back electrode, as well as a polymer buffer layer were investigated. By varying the film thickness we identified an equivalent circuit capable to fit our experimental data. We found a dielectric constant for the P3HT and for the P3HT:PCBM bulk.

*Key words:* Organic Solar Cells; Bulk Heterojunction; Impedance Spectroscopy; Equivalent Circuit.