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Influence of PEI doping on thermoelectric performance of PC70BM

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For the first time, effect of polyethylenimine (PEI) doping on thermoelectric performance of [6,6]-phenyl-C71 butyric acid methyl ester, commonly known as PC70BM, is investigated. This report shows a very good compatibility of these two materials in a thermoelectric system and significant improvement of the thermoelectric power factor of PC70BM as a result of doping with PEI compared to the previous studies on PC70BM reported by the first author. Here, samples were prepared from solutions of PC70BM in three different solvents: chlorobenzene, chloroform, and toluene without and with PEI of 2 different concentrations. As it was expected, addition of electron-rich PEI material increased electrical conductivity of the thermoelectric system and in contrast, decreased the absolute value of negative Seebeck coefficient due to introducing more charge carriers. As a result of doping, enhancement in thermoelectric power factor of PC70BM was observed.

Keywords: electrical conductivity, Seebeck coefficient, power factor, PC70BM, PEI.