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High pressure optical studies of donor-acceptor polymer heterojunctions KESHAB PAUDEL, MEERA CHANDRASEKHAR, SUCHI GUHA, University of Missouri, Columbia — Bulk heterojunction polymer solar cells are based on a composite blend of two materials with electron donating and electron accepting properties. We present optical studies of a ladder-type poly(para-phenylene) and a regioregular poly(3-hexylthiophene) polymer blended with a fullerene derivative under hydrostatic pressure. The photoluminescence and absorption spectra reveal different pressure coefficients for the pristine polymer compared with the blended system. Using a phenomenological model to determine the volume change of the system under pressure, we attribute the difference in the pressure coefficient to a change in the band-edge offset at the heterojunction upon enhanced interaction. The band-edge offset is found to increase with increasing pressures for both the ladder-type and thiophene systems.

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