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**Incorporating fluorinated moieties in fully conjugated donor-acceptor block copolymers** YOUNGMIN LEE, QING WANG, ENRIQUE D. GOMEZ, Pennsylvania State University — Fully conjugated donor-acceptor block copolymers are promising candidates for photovoltaics due to their ability to microphase separate at length scales commensurate with exciton diffusion lengths. These materials can also serve as model systems to study the relationship between molecular structure, microstructure, and optoelectronic properties of conjugated polymers. The development of new donor-acceptor block copolymers relies on the manipulation of the chemical structure to fine tune properties and improve overall performance when employed in photovoltaic devices. To this end, we have demonstrated the incorporation of fluorinated moieties in conjugated block copolymers. The introduction of fluorine, a strong electron withdrawing element, is known to influence phase separation and the bandgap, and as a result, optoelectronic properties. Fluorine was introduced to the acceptor block of poly(3-hexylthiophene-2,5-diyl)-*block*-poly((9,9-bis(2-octyl)fluorene-2,7-diyl)-*alt*-(4,7-di(thiophene-2-yl)-2,1,3-benzothiadiazole)-5′,5?-diyl) (P3HT-*b*-PFTBT). PFTBTs were prepared with di-fluorinated and mono-fluorinated TBT. We find that fluorination impacts the bandgap, morphology and performance in devices.

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