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Shock-Induced Electronic Structure Changes in Anthracene Single Crystals using Time-Resolved Spectroscopy NAOKI HEMMI, ZBIGNIEW DREGER, YOGENDRA GUPTA, Washington State University — Shock-induced changes in the electronic structure of anthracene single crystals were investigated up to 6 GPa using optical spectroscopy. Absorption experiments revealed significant changes in the electronic structure of anthracene crystals under shock compression: (i) monotonic red shift of the band edge of monomer absorption, (ii) a new broad and structureless band on the lower energy side of the red-shifted band. In laser induced fluorescence measurements, excimer-like fluorescence was observed following the excitation in the new absorption band. These results indicate the formation of new electronic states in shocked anthracene. The new states are attributed to dimer-type defects formed as a result of the high stress and plastic deformation due to shock loading. Work supported by DOE and ONR.

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