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Structural and Chemical Changes in Pyrene Crystals under Static High Pressures BAOZHOU SUN, ZBIGNIEW DREGER, YOGENDRA GUPTA, Washington State University — To gain insight into the response of molecular crystals to high pressures, pyrene crystals were examined in diamond-anvil cell experiments using Raman and FTIR spectroscopy. Three distinct Raman spectra were observed around 0.5 GPa, depending on the type of pressure transmitting medium. It was demonstrated that pyrene I: (i) transforms to pyrene II, in water and mineral oil, (ii) transforms to pyrene III, in argon and nitrogen and (iii) remains in the same phase, in solid media. These changes are discussed in terms of nonhydrostaticity of pressure transmitting media and intercalation of medium and sample. Irreversible chemical changes were observed upon compressing pyrene above 25 and 40 GPa. Recovered product was examined using FTIR spectroscopy indicating gradual transformation to an amorphous hydrogenated carbon structure. Work supported by DOE and ONR.

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