

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Investigation of polymorphism for amorphous and semi-crystalline poly (-ethylene terephthalate-) using high-pressure Brillouin spectroscopy JONGHYUN SONG, YOUNG-HO KO, Chungnam Natl Univ, MUHTAR AHART, Carnegie Institution of Washington, JAE-HYEON KO, Hallym University — High-pressure Brillouin spectroscopy was applied to clarify quantitatively the physical and mechanical difference of a polymer with distinct structures consisting of the same elements. The pressure dependences of elastic properties, Young's modulus, shear modulus, bulk modulus, and Poisson's ratio for an amorphous poly (-ethylene terephthalate-) [(-PET-)] and a semi-crystalline PET were compared for pressures up to 10 GPa. A collapse of free volume for two PETs was ascertained at the different value of pressure with different slopes of elastic properties, Young's modulus, shear modulus, and bulk modulus. Although the Poisson's ratios of a semi-crystalline PET increased linearly upon the pressure, those of an amorphous PET were almost constant. The P-V equation of state (EOS) for an amorphous PET was also determined and their isothermal bulk moduli extracted from Birch- Murnaghan and Vinet EOS were 6.3 GPa and 6.7 GPa, respectively.

Jonghyun Song
Chungnam Natl Univ

Date submitted: 11 Nov 2016

Electronic form version 1.4