

Abstract Submitted
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Shock behavior of carbon nanotubes at pressures up to 100 GPa¹ SERGEY ANAN'EV, VLADIMIR MILYAVSKIY, JIHT RAS, THOMAS SCHLOTHAUER, TU Bergakademie Freiberg, MATTIAS MASES, Lulea University of Technology, JEREMY WALDBOCK, MANUEL DOSSOT, XAVIER DEVAUX, EDWARD MCRAE, CNRS-University of Lorraine, ALEXANDER SOLDATOV, Lulea University of Technology — Recent experiments in a diamond anvil cell demonstrate high structural stability of double walled carbon nanotubes (DWNTs) exposed to a static pressure of 35 GPa. Here we report on the study of DWNTs after application of stepwise shock compression in a recovery assembly. Peak shock pressures in the specimens were achieved by several reverberations of waves between the walls of the recovery ampoules and were 14, 19, 26, 36, 52 and 98 GPa. The recovered samples were characterized by Raman, XPS and HRTEM and revealed outer wall disruption along with shortening of the DWNTs and unzipping of the DWNTs accompanying by the formation of graphene sheets. Structural damage of the DWNTs increases with the shock pressure. Simultaneously, the Raman data exhibit a steep increase of D/G-band intensity ratio.

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