

Abstract Submitted
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Microscopic Observation of Mechanism for Shear Wave Attenuation in Nylon-66¹ TING LI, Key Laboratory for Mechanical Behavior and Design of Materials (LMBD), Department of Modern Mechanics, University of Science and Technology of China, ZHIPING TANG, JIAN CAI — Gupta[1] found rapid shear attenuation near the impact surface for PMMA target. However, the physical mechanism remains unknown. In this article, nylon-66 was chosen for experimental investigation by using a keyed gas gun and EMV method, since nylon-66 has the spherical grain structure, which can be observed under a polarized microscope. The similar rapid shear attenuation occurs in the present study when the impact velocity and inclination angle reach a critical value. The polarized micro-observation of recovered samples shows that near the impact surface there is a melting layer of thickness about 6-8 μm , which causes the decay of the shear component propagating into the sample. The interesting thing is that there is a discontinuous crystalline layer about 2-3 μm thick above the melting layer, which indicates the melting may not directly caused by the friction on the impact surface and the heat produces inside of the sample and near the surface. Further observation discloses an adiabatic shear band near the surface to cause the material failure. [1]Gupta Y M, *J. Appl. Phys.* **51**(1980), 5352.

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