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Measurement of temperature and ignition time during fast compression and flow in PBX 9501 BRYAN HENSON, LAURA SMILOWITZ, JERRY ROMERO, BLAINE ASAY, PETER DICKSON, Los Alamos National Laboratory — We have made radiometric temperature measurements on a microsecond time scale during the compression and flow of PBX 9501 subsequent to impact. A cylindrical sample was fired into a sapphire window normal to the cylinder axis at velocities on the order of several hundred meters per second. Cylindrically symmetric flow resulted which led to the classic circular ignition pattern at the outermost radial distance from the center at times of a few to tens of microseconds and temperatures on the order of 800 degrees Celsius. We also observed a difference in ignition pattern for samples of beta or delta PBX 9501. We report the times and temperatures of ignition and relate them to our model of PBX 9501 decomposition kinetics. We also discuss these results in the context of various other methods of thermally and mechanically heating PBX 9501 and note the invariance of the decomposition kinetics of HMX to the method of heating.

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