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The use of Multi-Wall Carbon Nanotubes in the area of Nanoenergetic Materials PATRICIA MARTINEZ, UT-Dallas, MKHITAR HOBOSYAN, UT- Brownsville, ANVAR ZAKHIDOV, UT-Dallas, KAREN MARTIROSYAN, UT-Brownsville, NANOTECH TEAM, NANOSCIENCE LABORATORY TEAM — A new type of nanoenergetic wires were produced by spin- twist multi-walled carbon nanotube (MWCNT) sheets with Al-I_2O_5, a nanoenergetic material (NM) whose volumetric energy is two orders of magnitude greater than that of Trinitrotoluene (TNT) and has a detonation velocity of approximately 2500 m/s. MWCNT's sheets are a promising material in the area of NM because of their unique intrinsic properties such as high heat dispassion, low resistivity, high tensile stress and elasticity which help to achieve better self-propagating and strong nanoenergetic wires. The ignition of the NM/MWCNT wire shows a well- defined detonation of the NM along the MWCNT matrix. Due to the high thermal dissipation in the MWCNT, they do not burn, but rather direct the thermal energy of the detonation along the twisted coils, slowing the speed of propagation. This property can be further explored in the creation of new reinforced composites using NM as a micro and even nanoscale welder. The thread-like structure of the NM/MWCNT composite wires allows the utilization of textile technologies to create complex weaves which can be used as nanoexplosive fabrics with desired energetic properties for local heating, welding, targeted iodine release, and other properties as will be discussed in this work.

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