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Electrical Conductivity Measurements in Reacting Metastable Intermolecular Composites BLAINE ASAY, DOUGLAS TASKER, JAMES KING, VICTOR SANDERS, STEVEN SON, Los Alamos National Laboratory — Metastable Intermolecular Composite (MIC) materials are comprised of a mixture of oxidizer and fuel with particle sizes in the nanometer range. To better understand the reaction mechanisms of burning MIC materials, dynamic electrical conductivity measurements have been performed on a MIC material for the first time. Simultaneous optical measurements of the wave front position have shown that the reaction and conduction fronts are coincident within 160 μm. Unlike detonating high explosives (HE) where the conductivity profile is represented by an initial peak, followed by an exponential decay of conductivity,[] the MIC conductivity profile is a gradual, irregular ramp which increases from zero over many microseconds. This suggests that the reaction zone thickness is different in MICs compared to detonating HE. Static measurements of conductivity of pressed MIC pellets suggest that the conduction is associated with chemical reaction in the MIC.

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