

Abstract Submitted
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Thermal imaging of Al-CuO thermites¹ JOHN DENSMORE, KYLE SULLIVAN, JOSHUA KUNTZ, ALEX GASH, Lawrence Livermore National Laboratory — We have performed spatial in-situ temperature measurements of aluminum-copper oxide thermite reactions using high-speed color pyrometry. Electrophoretic deposition was used to create thermite microstructures. Tests were performed with micron- and nano-sized particles at different stoichiometries. The color pyrometry was performed using a high-speed color camera. The color filter array on the image sensor collects light within three spectral bands. Assuming a gray-body emission spectrum a multi-wavelength ratio analysis allows a temperature to be calculated. An advantage of using a two-dimensional image sensor is that it allows heterogeneous flames to be measured with high spatial resolution. Light from the initial combustion of the Al-CuO can be differentiated from the light created by the late time oxidization with atmosphere.

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