

Combustion Mechanism of nanothermite with Three-dimensionally Ordered Macroporous Structure

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We investigated the periodical nanothermite composed of three-dimensionally ordered macroporous (3DOM) copper (II) oxide frame as an oxidizer and aluminum nanoparticle as a fuel. Powder based synthesis of 3DOM nanothermite produced sufficient amount to measure the pressurization rate. Energy dispersive spectroscopy revealed 3DOM nanothermite had uniform array of each component. Pressure cell test produced actual combustion behavior rather than differential scanning calorimetry(DSC) test. We prepared several 3DOM nanothermite composite with different pore size. Structural change of 3DOM thermite caused different aspects of heat release. Therefore, we evaluated which mechanism was more correlate with actual combustion reaction.