Supplementary material for:

The Burn Rate of Calcium Sulfate Dihydrate-Aluminum Thermites

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KEYWORDS. Thermite, Calcium sulfate dihydrate, Aluminum, Casting, Burn Rate, Combustion

Larger scale Figures from text

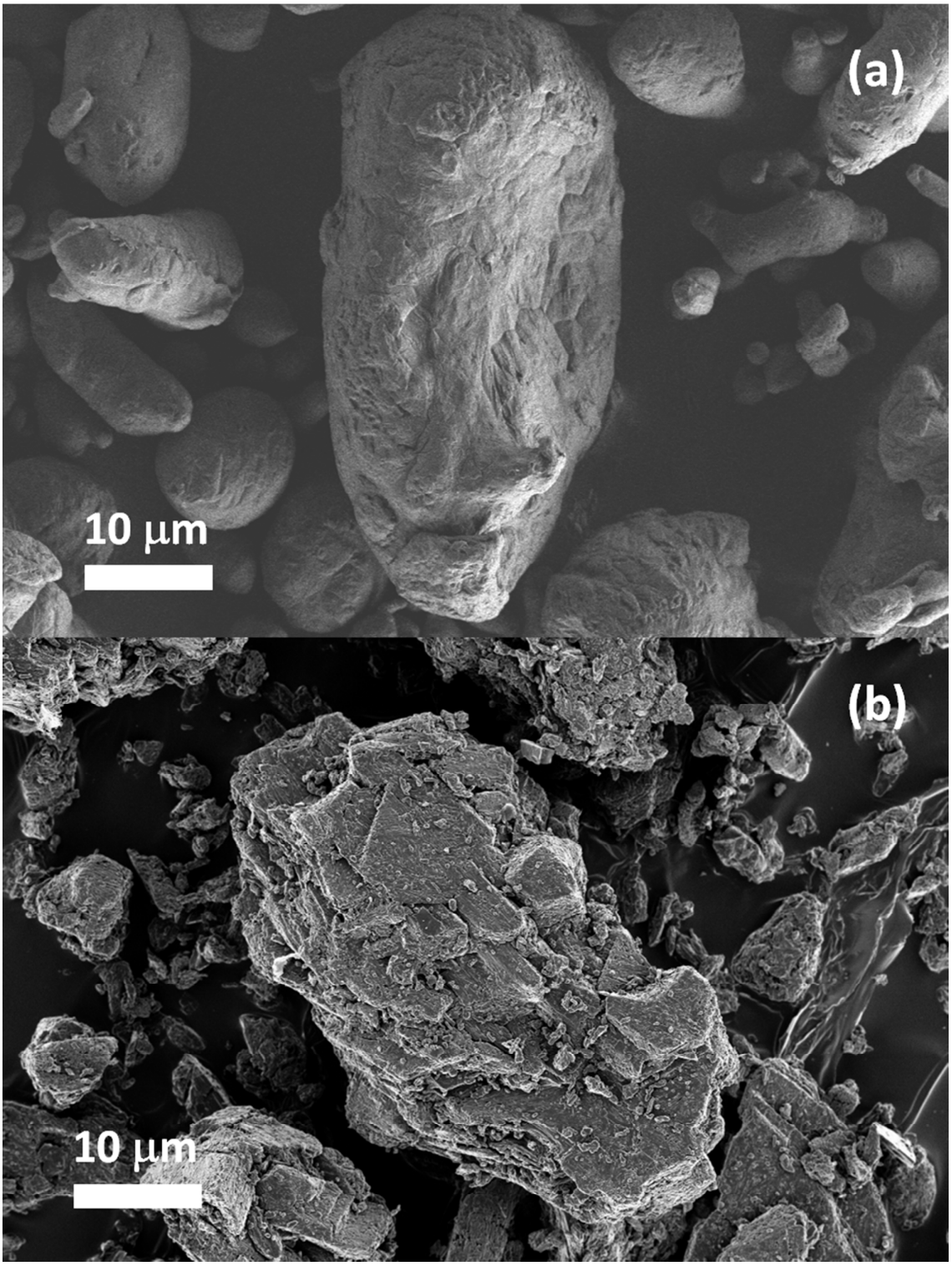

Figure 1. SEM images of the raw material powders: (a) Aluminum powder, and (b) $CaSO_4 \cdot 0.5H_2O$

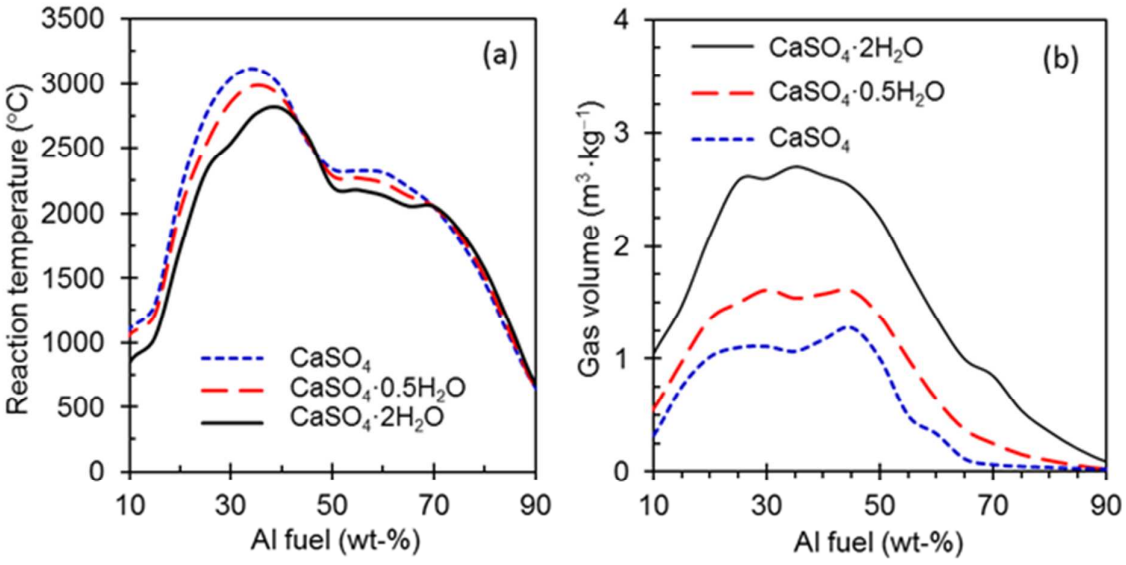

Figure 2. Calcium sulfate-aluminum thermites predictions obtained by Ekvi simulations for a pressure of 0.1 MPa. (a) Adiabatic reaction temperatures; (b) Total gas volume generated

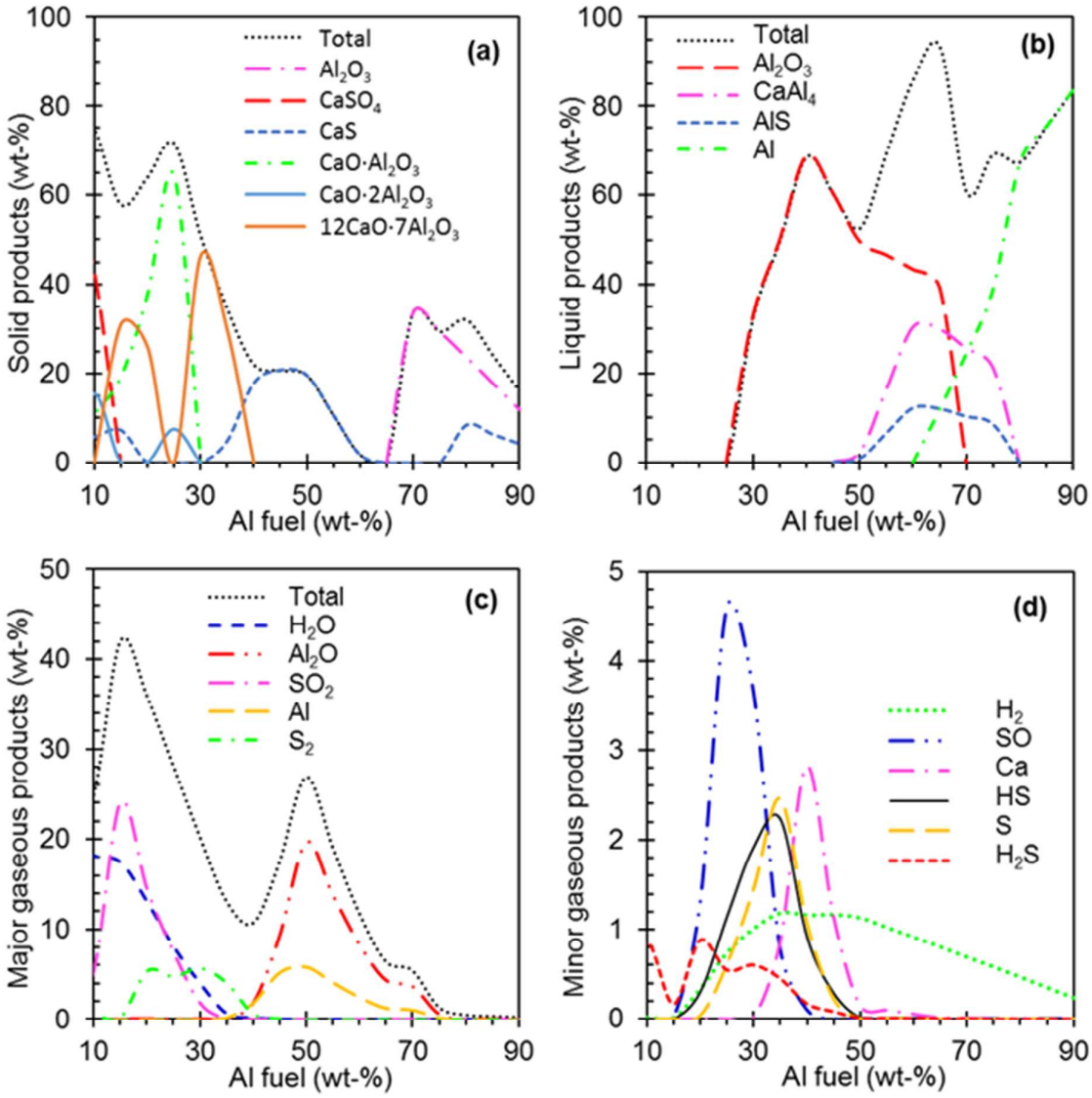

Figure 3. Ekvi -predicted product spectra at a pressure of 0.1 MPa under adiabatic reaction conditions for the $CaSO_4{\cdot}2H_2O$-Al system: (a) solids; (b) liquid; (c) major gaseous, and (d) minor gaseous products

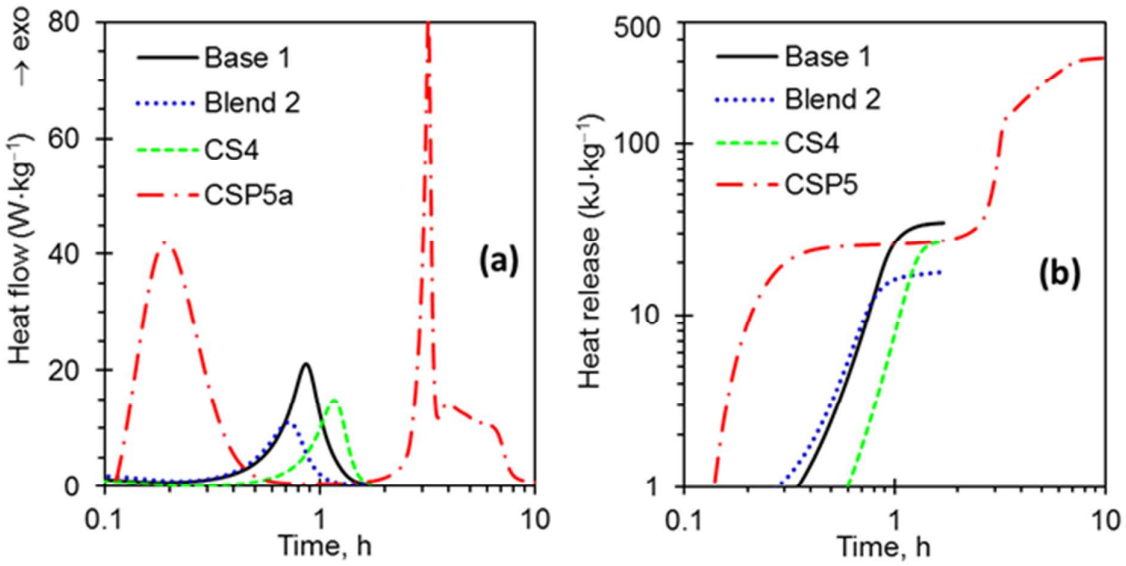

Figure 4. Representative isothermal heat calorimetry results for the Base1, Blend2, S4 and CSP5 compositions. The heat flows were normalized with respect to the total mass of solid powder (4.00 g) plus water (2.00 g)

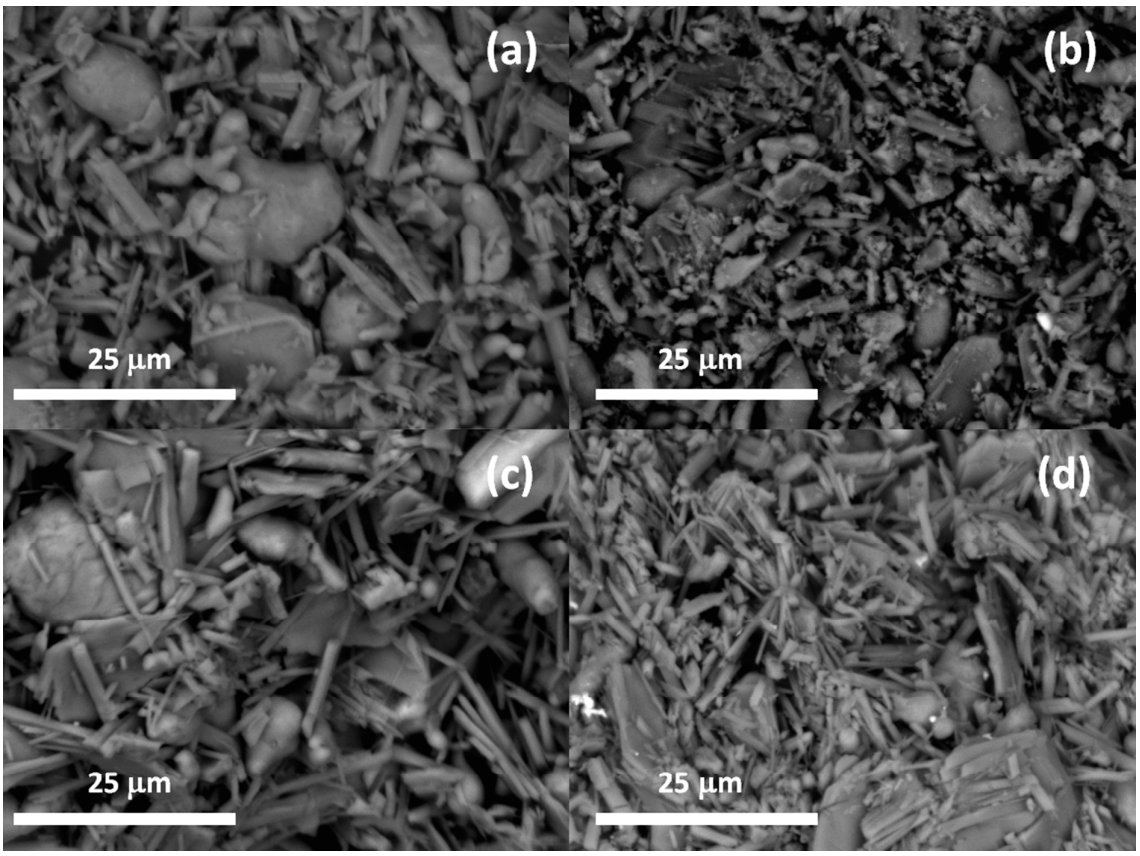

Figure 6. SEM images of fracture surfaces of casts: (a) Base1; (b) Blend 2; (c) S4, and (d) CSP5

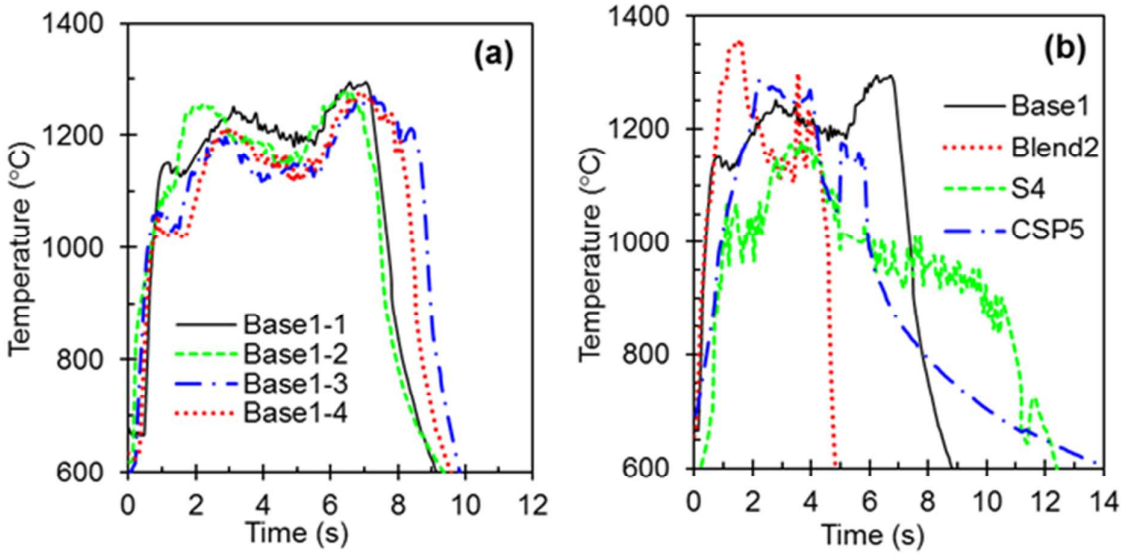

Figure 8. (a) Temperature profile of Base1 thermite recorded with a pyrometer indicating repeatability of burns; (b) Temperature profiles obtained for Base1, Blend2, S4 and CSP5 thermite systems recorded with a pyrometer

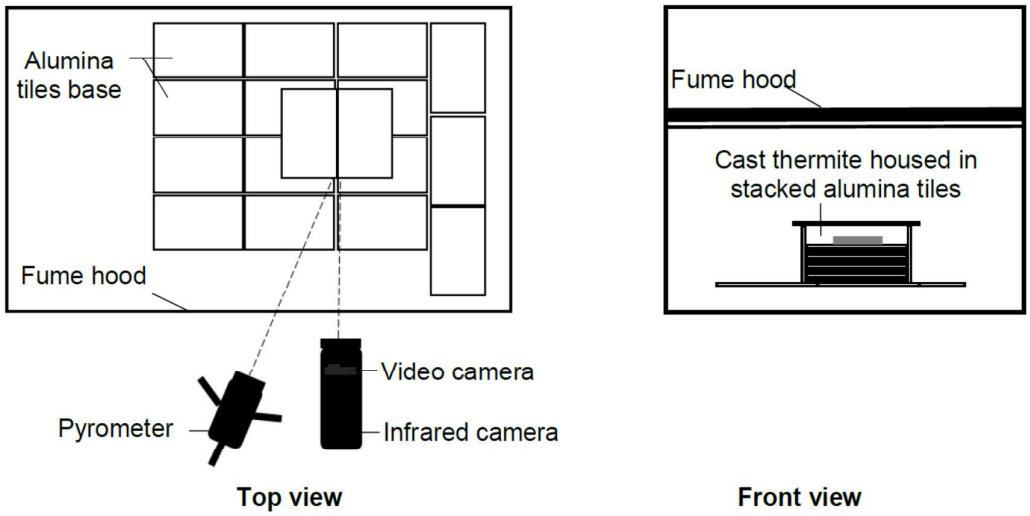

Figure S1. Open air burn set up conducted in the laboratory fume hood

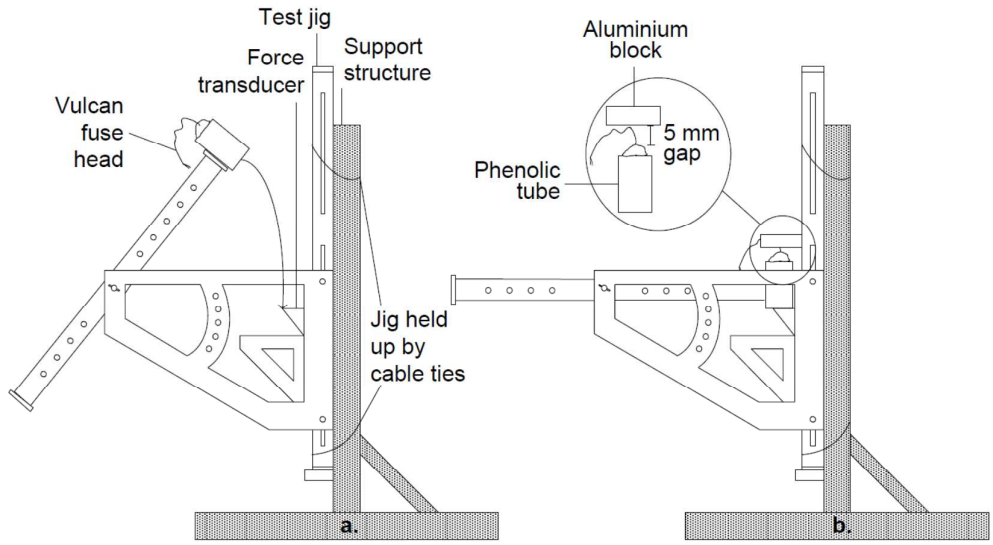

Figure S2. Jig set up (a) before and (b) after sample was loaded