探討不同型式鋁熱反應於燃燒合成氧化鋁強化之複合材料

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摘 要

本實驗主要探討利用自持傳遞高溫合成法(Self-propagating High-temperature Synthesis, SHS)，於氬氣環境下燃燒合成氧化鋁Al2O3強化合成金屬硼化物(TiB2、NbB2)、金屬矽化物(Ti5Si3、Nb5Si3)、碳化物(Ti3SiC2、TiC)與鈦鋁介金屬(TiAl)等複合材料。並使用鋁熱反應的原理，藉由Al與金屬氧化物(TiO2、B2O3、Nb2O5與SiO2)的氧化還原作用生成氧化鋁Al2O3。在實驗過程中，我們將對同一種欲合成出的複合材料，搭配使用不同的鋁熱反應，探討強化相Al2O3在此複合材料中可合成的不同範圍。並且探討出不同型式之鋁熱反應與複合材料中Al2O3含量對於其火焰鋒面傳遞模式、火焰鋒面傳遞速度、燃燒溫度及合成產物之影響。

關鍵詞 : 自持傳遞高溫合成 ; 鋁熱反應 ; 氧化鋁 ; 複合材料 ; 火焰鋒面傳遞模式 ; XRD產物分析

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