

عنوان مقاله:

The effects of different molten salt composition on morphology and purity of ZrB_2 powder obtained via direct molten salt reaction method

محل انتشار:

فصلنامه مواد پیشرفته و فرآوری، دوره 3، شماره 3 (سال: 1394)

تعداد صفحات اصل مقاله: 10

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خلاصه مقاله:

Zirconium Diboride (ZrB_2) powder was synthesized at low temperature via a Direct Molten Salt Reaction (DMSR) method. The influence of different salt compositions including eutectic mixture of (KF-NaF), (KF-KCl) and (KCl-NaCl) on the morphology and purity of the reaction products was studied. The obtained samples were characterized by scanning electron microscopy (SEM) and X-ray diffraction (XRD). Furthermore, the formation mechanism of ZrB_2 was investigated by DTA/TG. The results show that alongside eutectic mixture of chloride salt, ZrB_2 powder can be obtained with eutectic mixture of fluoride salt. In addition, obtained ZrB_2 powder without additional salt has hexagonal prism morphology, whereas ZrB_2 particles prepared with eutectic mixture of fluoride salt have higher purity and particle size and hexagonal morphology as well. Synthesized ZrB_2 Powder in chlorofluoride salt has lower particle size and purity and non-uniform morphology. Synthesized ZrB_2 powder is different from starting material in term of morphology and particle size therefore the dissolution-precipitation mechanism may play a dominant role on the synthesis of ZrB_2 during DMSR process.

کلمات کلیدی:

Zirconium Diboride, Molten Salt, reaction, Low temperature, Composition

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