

عنوان مقاله:

Effect of pH and temperature on the sol-gel synthesis of TiC nanopowders

محل انتشار:

اولین همایش بین المللی نانو تکنولوژی در فرآیندهای مهندسی (سال: 1402)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Gholamreza Khalaj - Department of Materials Science and Engineering, Saveh Branch, Islamic Azad University, Saveh, Iran

Abolhassan Najafi - Department of Materials Science and Engineering, Saveh Branch, Islamic Azad University, Saveh, Iran

Mohammad Morshed - Department of Mechanical Engineering, South Tehran Branch, Islamic Azad University, Tehran, Iran

خلاصه مقاله:

In the present study, titanium carbide powders with suitable morphology and nanometer particle size were synthesized by the sol-gel method to investigate the parameters affecting the properties of sol and the final powder. The initial sol was prepared in a four-component system of alkoxide-water-alcohol-citric acid based on the chemical process of sol-gel. Accordingly, the results of the Dynamics Light Scattering (DLS) showed that at low pHs, the particles size was below 10 nm. According to the zeta potential diagram and by examining the conditions of sol at different pHs, 4.5 was determined as the optimal pH and to prevent the bonding of particles within the sol, ammonium polycarboxylate dispersant was used. The temperature at which particles were formed was determined using Differential thermal analysis (DTA) and Thermal gravimetric analysis (TG). X-ray diffraction (XRD) patterns showed the presence of a completely amorphous phase at 700 °C. It was also observed that with increasing temperature, TiC crystallization started from 1200 °C and ended at 1400 °C. Transmission electron microscopy (TEM) and scanning electron microscopy (SEM) micrographs at 1400 °C showed the completely spherical morphology of particles of nanometer size so that no agglomerate was observed.

کلمات کلیدی:

Titanium Carbide; Nanopowder; Synthesis; Sol-gel; Mesoporous; Carbothermal

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/2035838>

