

Microwave synthesis of boron carbide doped with cobalt

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Boron carbide (B_4C) is a material that has several interesting properties, among them, high hardness, high chemical resistance, high mechanical resistance, a high melting point, low density, and aside from having interesting electronic and nuclear resources it can be applied in various products and segments of the industries, such as cutting tools, aerospace, ballistics and medical^[1]. There are several ways to synthesize this material. Among them, a direct carboreduction of boric acid (H_3BO_3) mixed together with a source of carbon (carbon black and activated carbon) by microwave, which was used in this work to obtain nanoparticles of boron carbide. Two different concentrations of boric acid were analyzed to determine an influence of the concentration of this acid in obtaining the B_4C nanoparticles. In addition, was analyzed an equiaxed morphology for an elongated nanoparticulate (nanorods) and a level of doping was added to a cobalt oxide to determine the influence of this oxide on the carbide nanostructure. The post-synthesized were characterized in stages (X-ray diffraction), morphologically (scanning electron microscopy), surface area and FT-IR.

[1] V. Domnich, Journal of the American Ceramic Society. **94**, (2011) 3605-3628.