

INFLUENCE NANOPOWDER IMPURITIES IN THE RAW MATERIALS ON THE PARAMETERS OF SPS-CERAMICS

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In previous studies [1-4] showed that there is a fundamental possibility of a full cycle of the ceramic with submicrostructure by consolidating product plasmodynamic synthesis. Dispersed and phase characteristics of the base product [5] have a significant impact on the physical and mechanical properties of the sintered ceramics. Was made from a mixture of milled on a planetary mill and a large fraction of the ultrafine fraction in a ratio of 3:1.

Figure 1 shows the results of XRD analysis of the obtained sample ceramics. Comparing XRD-powder billets and pictures sintered product shows that occurs during sintering nitridoobrazovanie. It is also evident from the increase in physical broadening of the strongest reflexes and split their highs. SCR size drops to 75 nm.

This mode SPS, selected at random, will provide the compact with the material density $\rho = 5,0 \text{ g/cm}^3$, which is 92% of the density of a single crystal.

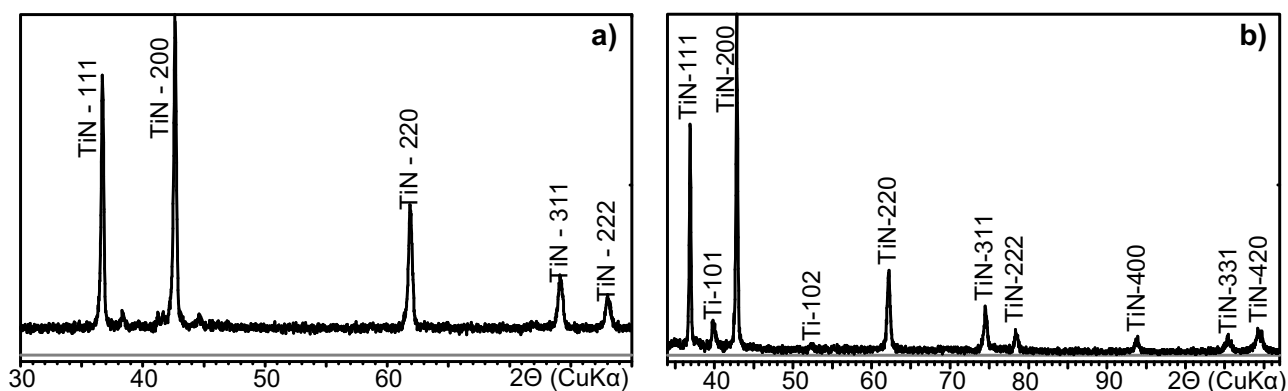


Figure 1 - The results of the powder X-ray diffraction TiN, obtained by grinding coarser fractions (a) and XRD-pattern of a polished surface of the obtained sample tablets SPS-TiN-ceramics from the milled coarse fraction of mother (75%) and addition of UDP (25%) (b)

This confirms the assumption that the cause of focal defects is a strong agglomeration of the product. The hardness of the resulting materials measured by Vickers indenter method of reduced imprint was 17 GPa.

This sample was tested for cutting properties, for boring bars of hardened steel (55HRC) compared to industrial designs ceramic. The sample showed good cutting properties.

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