

STRUCTURE OF “METAL / Ti_3AlC_2 ” COMPOSITES OBTAINED BY SELECTIVE LASER SINTERING*

M.G. KRINITCYN^{1,2}, O.M. KASHNIKOVA¹, M.P. RAGULINA¹, I.O. NIKOLAEV¹

¹Tomsk Polytechnic University, Tomsk, Russia, 634050

²Institute of Strength Physics and Material Science SB RAS, Tomsk, Russia, 634055

MAX phases are ternary compounds having a specific structure and combining the properties of metal and ceramics [1]. Like metals, these compounds show high thermal and electrical conductivity, as well as a relatively high resistance to thermal shock. Moreover, like ceramics, they have a high modulus of elasticity, low thermal coefficient of expansion, and high heat resistance.

The combination of metal and ceramic properties makes the MAX phase attractive for use in composites. Composites containing MAX phases of Ti-Al-C systems in combination with other materials are known from the literature. The main components are TiC [2] and intermetallics of the Ti-Al system [3]. There are also composites with metals (copper [4], silver [5], etc.), nickel alloys [6], silicon carbide [7], aluminum oxide [8], and others.

The paper presents a study of the preparation of composite materials with a metal matrix and Ti_3AlC_2 particles (Fig. 1) from powder mixtures of various compositions. The bulk products were obtained from these mixtures using the selective laser sintering technology at powers providing dense samples, but not allowing significant destruction of the MAX phase. Investigations are made of the structure and phase composition of the obtained samples using optical and electron microscopy, as well as XRD and EDX analysis.

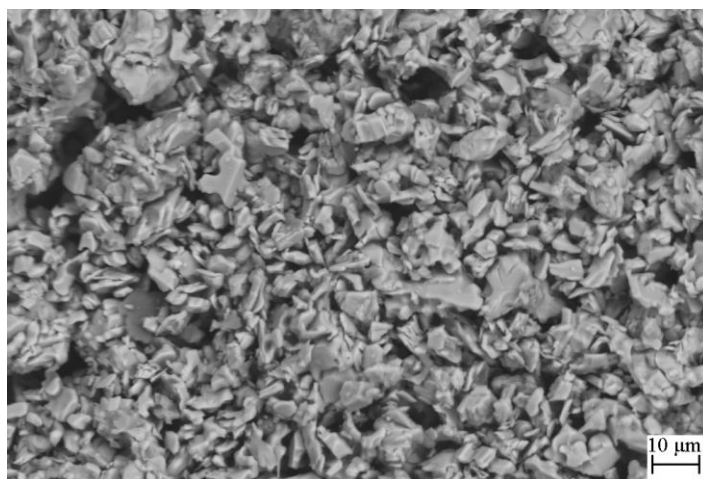


Fig.1. The morphology of Ti_3AlC_2 powder.

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