Brief information about the project

Name of the project	AP14871554 “Optimization of an innovative synthesis of aluminized titanium carbide used for synthesis of 2D Mxene materials (Ti3C2, Ti2C)”
Relevance	The project will develop a scaled synthesis of materials Ti3AlC2, and Ti2AlC, which are precursors for the synthesis of 2D materials Ti3C2 and Ti2C. The innovative approach of the project is based on multistep optimization of the synthesis process to reduce energy costs and to design a pilot version of the sintering equipment with a capacity of more than 100 g per synthesis.
Purpose	The aim of the project is to optimize the method of synthesis of aluminized titanium carbides to increase the yield of the final product, reduce the cost of the material and to design a pilot version of the sintering equipment for further scaling and product commercialization
Objectives	Construction of a small setup to optimize the synthesis method. Optimization of the precursor mixture homogenization process Optimization of sintering time and temperature Scaling up the optimized synthesis process
Expected and achieved results	The expected results of the project are to optimize the method of synthesis of materials of MAX phases (Ti3AlC2 and Ti2AlC) and scaling the optimized synthesis method to obtain up to 100 g of product per sintering. The proposed multi-stage optimization of the method of synthesis of aluminized titanium carbides is new and multifaceted and will allow to obtain a cleaner product. The results of the study are patentable, which should provide the possibility of subsequent commercialization. At this stage of the project, there are no plans to commercialize the resulting product, however, if the project is successful, its further implementation in the direction of commercialization is planned.
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List of publications with links to them	
Patents	

Figure 1. High Temperature Tubular Vacuum Furnace for MAX Phase Synthesis

Рисунок 2. Obtained powders of the MAX phase