

## **ABSTRACT**

The main aim of this thesis was to prove the possibility of TiC preparation using modern synthetic and processing technique assisted by electric field. The starting material consisted of prepared TiO<sub>2</sub> and commercially available graphite. The mixture was pressed into tablets and treated in electric circuit under different conditions. Soft graphite felt electrodes were used for the experiments, these eliminated the low fracture toughness of the pressed pellets. Two sets of experiments were conducted, firstly in argon under atmospheric pressure, and later under argon vacuum. The synthesis was successful for molar ratio Ti:C 1:3 in the initial mixture and applied voltage 25 V, while the presence of vacuum was crucial. The experiments in argon gas under atmospheric pressure showed sporadic conversion to carbide, while the experiment under vacuum led to quantitative conversion.

**Keywords:** titanium carbide, reactive flash sintering, field assisted sintering, carbothermal reduction, high temperature ceramics