

Electrochemical Synthesis of Binary and Ternary Refractory Compounds in the System Ti-Si-B from Chloride-Fluoride Melts

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Electrochemical synthesis of binary and ternary compounds in the system Ti-Si-B from chloride-fluoride melts has been investigated by voltammetry and electrolysis. Electrochemical syntheses of titanium diboride, four titanium silicides (TiSi_2 , TiSi , Ti_5Si_4 , Ti_5Si_3), silicon tetraboride and a new ternary compound, $\text{Ti}_5\text{Si}_3\text{B}_3$, have been found to be one-step processes. The stoichiometry of the deposited compounds has been found to correlate with the bulk concentration of Ti, Si and B ions in the melt.

Key words: Refractory Compounds; Electrochemical Synthesis; Molten Salts.