Titanium Subchloride Synthesis by Reaction of Titanium with $TiCl_4$

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Abstract

In order to establish a new semi-continuous/high-speed titanium production process based on the magnesiothermic reduction of titanium subchlorides, a novel synthetic process of titanium subchlorides ($TiCl_x$, x = 2, 3) by reacting titanium metal with $TiCl_4$ was investigated. Titanium metal powder placed on a molybdenum tray was heated to 1273 K in a stainless steel reactor filled with argon gas, and $TiCl_4$ liquid was supplied into the reactor by a pump at a rate of 0.12~0.64 g/min. Deposits recovered from the trays after the experiment were identified to be $TiCl_2$. Under certain conditions, a trace of $TiCl_3$ was also observed in the $TiCl_2$ deposit. Currently, a more efficient method for titanium subchloride production using a molten salt medium is under investigation. Some results on the reduction of synthesized $TiCl_2$ by magnesium will also be shown.