THE EFFECT OF VARIATIONS MECHANICAL MILLING TIME AND SINTERING TEMPERATURE ON MICROSTRUCTURE CHARACTERIZATION OF MMC Mg-Al-TiO₂

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Abstract
The necessary with the ability of structural components, light and strong experience a significant improvement. This has encouraged the development of new materials based Metal Matrix Composites (MMC's). Composite Mg-Al-TiO₂, with Mg as the matrix and the Al-TiO₂ produced Al₃Ti as reinforced already developed.

This research is based on the reaction 3TiO₂ + 13Al → 3Al₃Ti + 2Al₂O₃. Powder mixed with the milling methods on speed 800 rpm. Variations using mechanical milling time within 24 hours, 48 and 60 hours. The process of using assessment compaction 500 MPa. The process of sintering temperature variations using the 800, 900, 1000 °C. Material characterization specimens using MO, XRD, SEM / EDS, and DTA/TGA.

Intermetallic Al₃Ti compound in temperatures ranging form 800 °C with the long mechanical grinding to 48 hours with the highest peak at 2θ = 39.54. The length of time the structure of the mechanical grinding MMC akan increasingly homogeneous.
From this research note that the MMC specimens Mg-Al-TiO₂ with the long mill 48 hours and sintering temperature 900 °C intermetallic Al₃Ti compound produced the most optimal.

*Keywords: Metallurgy powder, composite Mg-Al-TiO₂, Intermetalik compound.*