

Microstructural evaluation of ball-milled nano Al₂O₃ particulate-reinforced aluminum matrix composite powders

ABSTRACT

A mechanically alloyed mixture of Al-1 wt.% nano-alumina (n-Al₂O₃) composite powders was produced using a planetary ball milling machine. Different milling times were applied to investigate the effect of milling time on the dispersion and microstructure of n-Al₂O₃ particulate reinforcement within the aluminum matrix. A good homogeneous dispersion of n-Al₂O₃ particulates was observed after 8 h of milling. Longer milling times had no significant effect on the dispersion and morphology of n-Al₂O₃ particulates within the aluminum matrix because a steady state had been reached.

Keyword: Composite materials; Microstructure; Ductility; Powder metallurgy