

## Microstructural evaluation of ball-milled nano Al<sub>2</sub>O<sub>3</sub> particulate-reinforced aluminum matrix composite powders

### ABSTRACT

A mechanically alloyed mixture of Al-1 wt.% nano-alumina (n-Al<sub>2</sub>O<sub>3</sub>) 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-Al<sub>2</sub>O<sub>3</sub> particulate reinforcement within the aluminum matrix. A good homogeneous dispersion of n-Al<sub>2</sub>O<sub>3</sub> particulates was observed after 8 h of milling. Longer milling times had no significant effect on the dispersion and morphology of n-Al<sub>2</sub>O<sub>3</sub> particulates within the aluminum matrix because a steady state had been reached.

**Keyword:** Composite materials; Microstructure; Ductility; Powder metallurgy