

## Mechanochemical Synthesis of Al<sub>2</sub>O<sub>3</sub>/Mo Nanocomposite Powders from Molybdenum Oxide

**Authors :** Behrooz Ghasemi, Bahram Sharjijan

**Abstract :** Al<sub>2</sub>O<sub>3</sub>/Mo nanocomposite powders were successfully synthesized by mechanical milling through mechanochemical reaction between MoO<sub>3</sub> and Al. The structural evolutions of powder particles during mechanical milling were studied by X-ray diffractometry (XRD), energy dispersive X-ray spectroscopy(EDX) and scanning electron microscopy (SEM). Results show that Al<sub>2</sub>O<sub>3</sub>-Mo was completely obtained after 5 hr of milling. The crystallite sizes of Al<sub>2</sub>O<sub>3</sub> and Mo after milling for 20 hr were about 45 nm and 23 nm, respectively. With longer milling time, the intensities of Al<sub>2</sub>O<sub>3</sub> and Mo peaks decreased and became broad due to the decrease in crystallite size. Morphological features of powders were influenced by the milling time. The resulting Al<sub>2</sub>O<sub>3</sub>- Mo nanocomposite powder exhibited an average particle size of 200 nm after 20 hr of milling. Also nanocomposite powder after 10 hr milling had relatively equiaxed shape with uniformly distributed Mo phase in Al<sub>2</sub>O<sub>3</sub> matrix.

**Keywords :** Al<sub>2</sub>O<sub>3</sub>/Mo, nanocomposites, mechanochemical, mechanical milling

**Conference Title :** ICNSE 2014 : International Conference on Nanomaterials Science and Engineering

**Conference Location :** Istanbul, Türkiye

**Conference Dates :** July 30-31, 2014