

Mechanochemical Behaviour of Aluminium-Boron Oxide-Melamine Ternary System

Authors : Ismail Seckin Cardakli, Mustafa Engin Kocadagistan, Ersin Arslan

Abstract : In this study, mechanochemical behaviour of aluminium - boron oxide - melamine ternary system was investigated by high energy ball milling. According to the reaction $\text{Al} + \text{B}_2\text{O}_3 = \text{Al}_2\text{O}_3 + \text{B}$, stoichiometric amount of aluminium and boron oxide with melamine up to ten percent of total weight was used in the experiments. The powder characterized by X-ray diffraction (XRD), Fourier Transform Infrared Spectroscopy (FT-IR) and Scanning Electron Microscopy (SEM) after leaching of product by 1M HCl acid. Results show that mechanically induced self-sustaining reaction (MSR) between aluminium and boron oxide takes place after four hours high energy ball milling. $\text{Al}_2\text{O}_3/\text{h-BN}$ composite powder is obtained as the product of aluminium - boron oxide - melamine ternary system.

Keywords : high energy ball milling, hexagonal boron nitride, mechanically induced self-sustaining reaction, melamine

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