

Development of Ferrous-Aluminum Alloys from Recyclable Material by High Energy Milling

Authors : Arnold S. Freitas Neto, Rodrigo E. Coelho, Erick S. Mendonça

Abstract : This study aimed to obtain an alloy of Iron and Aluminum in the proportion of 50% of atomicity for each constituent. Alloys were obtained by processing recycled aluminum and chips of 1200 series carbon steel in a high-energy mill. For the experiment, raw materials were processed thorough high energy milling before mixing the substances. Subsequently, the mixture of 1200 series carbon steel and Aluminum powder was carried out a milling process. Thereafter, hot compression was performed in a closed die in order to obtain the samples. The pieces underwent heat treatments, sintering and aging. Lastly, the composition and the mechanical properties of their hardness were analyzed. In this paper, results are compared with previous studies, which used iron powder of high purity instead of Carbon steel in the composition.

Keywords : Fe-Al alloys, high energy milling, metallography characterization, powder metallurgy

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