

Study of Commercially Pure Aluminum Grain Refining by TiB₂, Processed by High Energy Ball Milling

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The present work aims at the analysis of the effect of the processing of titanium diboride (TiB₂) by high energy grinding, in the refining of commercially pure aluminum grain. For this purpose, the ground material was mixed with powdered aluminum at 0.02; 0.05; 0.1; 0.15 and 0.3 of weight percent of TiB₂ for the final molten load. The samples were compacted into pastilles of 3 mm diameter and sintered for further addition in the molten aluminum, in order to promote the dissolution of the same ones and dispersion of the boride particles. The final molten product solidification was carried out using thermal analysis cups monitored by thermocouples and dataloggers system in order to evaluate nucleation and suppression of grain growth during solidification process. The results show a significant grain refining for the samples from 0.15 weight of TiB₂ content according macrographic and micrographic analysis.

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