World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:12, No:03, 2018

Numerical Modelling of Surface Waves Generated by Low Frequency Electromagnetic Field for Silicon Refinement Process

Authors : V. Geza, J. Vencels, G. Zageris, S. Pavlovs

Abstract : One of the most perspective methods to produce SoG-Si is refinement via metallurgical route. The most critical part of this route is refinement from boron and phosphorus. Therefore, a new approach could address this problem. We propose an approach of creating surface waves on silicon melt’s surface in order to enlarge its area and accelerate removal of boron via chemical reactions and evaporation of phosphorus. A two dimensional numerical model is created which includes coupling of electromagnetic and fluid dynamic simulations with free surface dynamics. First results show behaviour similar to experimental results from literature.

Keywords : numerical modelling, silicon refinement, surface waves, VOF method
Conference Title : ICMMFPMM 2018 : International Conference on Metallurgy, Metal Forming Processes and Materials Modelling
Conference Location : Paris, France
Conference Dates : March 15-16, 2018