

The Manufacturing of Metallurgical Grade Silicon from Diatomaceous Silica by an Induction Furnace

Authors : Shahrazed Medeghri, Saad Hamzaoui, Mokhtar Zerdali

Abstract : The metallurgical grade silicon (MG-Si) is obtained from the reduction of silica (SiO_2) in an induction furnace or an electric arc furnace. Impurities inherent in reduction process also depend on the quality of the raw material used. Among the applications of the silicon, it is used as a substrate for the photovoltaic conversion of solar energy and this conversion is wider as the purity of the substrate is important. Research is being done where the purpose is looking for new methods of manufacturing and purification of silicon, as well as new materials that can be used as substrates for the photovoltaic conversion of light energy. In this research, the technique of production of silicon in an induction furnace, using a high vacuum for fusion. Diatomaceous Silica (SiO_2) used is 99 mass% initial purities, the carbon used is 6N of purity and the particle size of $63\mu\text{m}$ as starting materials. The final achieved purity of the material was above 50% by mass. These results demonstrate that this method is a technically reliable, and allows obtaining a better return on the amount 50% of silicon.

Keywords : induction furnaces, amorphous silica, carbon microstructure, silicon

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