

Study for Energy-Saving Operation of Electric Furnace in Steel Manufacturing

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Abstract

Ube Industries Ltd. and our group companies have many business fields that handle high temperature processes. Some of them are “Cement clinker manufacturing”, “Electric furnace steel manufacturing”, “Magnesia clinker manufacturing from sea water”, “Silicon nitride synthesized from Silicon tetra-Chloride and Ammonia”, etc.

Our group company, Ube Steel Co., LTD has 60T-scale electric furnace for steel manufacturing. Unlike the blast furnace, steel scrap is used as a raw material in the electric furnace. And also main heat source is electricity, CO₂ emission is lower compared to the blast furnace.

In the electric furnace steel-making, most of the production cost is electric energy, so energy-saving operation is needed. Heat sources are not only electricity but also combustion burner. By applying FactSage, we evaluated the influence on the balance of them to the total production cost. FactSage has suitable database steel-making process analysis (FTmisc, FToxid, GTOX, etc.), so it is very valuable tool in this study.

In the future, we plan the development of continuous calculation by using ChemSheet. And we are going to study on steel refining process and casting process.