

ChemSheet modelling

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A ChemSheet model has been developed for the submerged arc furnace (SAF) used in the production of the ferrochromium steel at Outokumpu Tornio Works. The mined chromite ore is crushed, preheated by the process off-gases and finally reduced by coke in the smelter furnace to form the ferrochromium melt and the liquid slag which are then tapped and separated. The model contains simplified unit operations for the CO burner, the preheater, the feeding tubes, the smelter and the CO gas scrubbers. The constrained Gibbs energy minimization method has been used to control some of the reactions as the feed contains lumps of ore that should not react with the coke particles at lower temperatures. The model can be used as a calculation tool for the process charging.