# Modeling of a Blast Furnace with Both CFD and Thermodynamics Principles

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## Abstract

In this research, we first estimate the ideal discharge gas contents and volume flow rates based on thermodynamics principles, which of course are based on the assumption that the spatial mixing is complete and the combustion process is thorough. In practice, mixing depends highly on the spatial arrangement of the injection fluid, the spatial temperature distribution, and the spatial design of the furnace. Therefore, a more comprehensive simulation based on Computational Fluid Dynamics will be introduced to study the turbulent mixing and combustion process within the furnace. Some feasible measures will be proposed to eliminate or reduce the emission of toxic gases.

**Keywords:** Combustion, turbulent mixing, computational fluid dynamics

### References

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