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Numerical Modeling of MILD Combustion

By Ju Pyo Kim

Shaker Verlag Apr 2008, 2008. Taschenbuch. Condition: Neu. Neuware - MILD (Moderate and Intensive Low oxygen Dilution) combustion is a promising technology to decrease pollutant emissions and to improve combustion efficiency. A combination of air preheating and fuel dilution with combustion products of low oxygen concentration are the main features of this technique. In MILD combustion mode, preheated air and fuel are gradually mixed with large amounts of recirculated exhaust gas. The present Ph.D. thesis presents the nature of MILD combustion and the Eddy Dissipation Concept (EDC) which is able to handle the turbulence-chemistry interaction in detail. In the following, the applied global reaction mechanisms are addressed. Strategies for inclusion of a soot model into the coal combustion processes are discussed, and the developed NO model in MILD combustion mode for coal as well as for gas was presented. For the numerical simulations, the 3D-CFD code AIOLOS for a turbulent reacting flow is used. In order to evaluate the predictive capability of the applied models, a piloted methane-air jet flame SANDIA flame D and the entrained flow coal combustion reactor are studied. In the following, numerical simulations are presented which have been performed for natural gas and coal combustion with...



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