



***ICEEM/03 – ENVIRONMENTAL ENGINEERING
SECTION***

Environmental Modelling, Simulation and Optimization

**DYNAMIC MODELLING FOR SLUDGE
COMBUSTION CONTROL**

Li Shi^{1*}, Catherine Cadet¹, Pierre-Xavier Thivel², Françoise Delpech²

¹*Laboratoire d'Automatique de Grenoble-ENSIEG-BP46 38402 Saint Martin d'Hères cedex France*

²*GRECA (Groupe de Recherche sur l'Environnement et la Chimie Atmosphérique) - Université
Joseph FOURIER - 39-41 boulevard Gambetta - 38000 Grenoble, France*

Abstract

This paper deals with the design of a model of sludge combustion in a circulating fluidized bed (CFB) furnace to be further implemented in an advanced control law. The transient behaviors of the temperature and the flue gas concentration are predicted. The emphasis is put on the choice of the chemical reactions based on (phisco-chemical) considerations. This model includes dynamic rates of sludge combustion reactions, which are tuned considering literature references and experimental apparatus. The simulation results are realistic and the model can now be improved to include more complex hydrodynamics modeling.

Keywords: circulating fluidized bed, sludge combustion, dynamic model

* Author to whom all correspondence should be addressed: Phone: +33-(0)4-76826413, Fax: +33-(0)4-76826388, e-mail: Shi.Li@lag.ensieg.inpg.fr