

[home](#)[about](#)[publishers](#)[editorial boards](#)[advisory board](#)[for authors](#)[call for papers](#)[subscription](#)[archive](#)[news](#)[links](#)[contacts](#)[authors gateway](#)

Are you an author in Thermal science? In preparation.

THERMAL SCIENCE

International Scientific Journal

[Xin-Rui Li](#), [Woo-Sub Lim](#), [Yusaku Iwata](#), [Hiroshi Koseki](#)

THERMAL BEHAVIOR OF SEWAGE SLUDGE DERIVED FUELS

ABSTRACT

The utility of sewage sludge as a biomass fuel is taken as an approach to deal with global warming. Thermal characterization of this new type of fuel is a premise before it is practically used in real facilities. Four sludge derived fuels were examined by thermal calorimeters (TG-DTA, C80, and TAM) at temperature ramp and isothermal conditions. Heat generation at low temperature was found in some sludge species. The corresponding spontaneous ignition was measured in an adiabatic spontaneous ignition tester at 80 °C. The reason of the thermal behaviors of the sludge fuels was discussed. The critical temperature of large scale pile-up was predicted.

KEYWORDS

[biomass fuel](#), [self heating](#), [sewage sludge](#), [thermal activity](#)

PAPER SUBMITTED: 2008-01-28

PAPER REVISED: 2008-02-17

PAPER ACCEPTED: 2008-02-19

DOI REFERENCE: [TSCI0802137L](#)

CITATION EXPORT: [view in browser](#) or [download as text file](#)

THERMAL SCIENCE YEAR 2008, VOLUME [12](#), ISSUE [2](#), PAGES [137 - 148]

REFERENCES [view full list]

1. Samela, D., et al., Environmental Aspects of the Combustion of Sewage Sludge in a Utility Boiler, *Environmental Progress*, 5 (2006), 2, pp. 110-115
2. ***, Study on the Safety Measure Regarding Products and Inflammable Gas Sludge Oriign, Japan Institute of Wastewater Engineering Technology, 2004
3. Rahman, M., et.al., Low Temperature Oxidation of Low Rank Coals, *Chem. Eng. Commun.*, 46 (1986), 4-6, pp. 209-226
4. Jones, J. C., Vais, M. Factors Influencing Spontaneous Heating of Low-Rank Coals, *J. Hazardous Materials*, 26 (1991), 2, 203-212
5. ***, JIS: Japanese Industrial standards series
6. Babrauskas, V., *Ignition Handbook*, Fire Science Publisher, Issaquah, Wash., USA, 2003

[Authors of this Paper](#)[Related papers](#)[Cited By](#)[External Links](#)

7. Rizk, M. C., Bergamasco, R., Tavares, C. R. G., Anaerobic Co-Digestion of Fruit and Vegetable Waste and Sewage Sludge, *Int. J. Chem. Rea. Eng.*, 5 (2007), 29A, pp. 1065-1074
8. Frank-Kamenetskii, D. A., *Diffusion and Heat Transfer in Chemical Kinetic*, 2nd edition, Plenum Press, New York, USA, 1969
9. Jones, J. C., Calculation of the Frank-Kamenetskii Critical Parameter for a Cubic Reactant Shape from Experimental Results on Bituminous Coals, *Fuel*, 78 (1999), 1, pp. 89-91
10. Drysdale, D., *An Introduction to Fire Dynamics*, 2nd, John Wiley and Sons, New York, USA, 1999, pp. 163-289
11. Bowes, P. C., *Self-Heating: Evaluating and Controlling the Hazards*, Elsevier, London, 1984

PDF VERSION [DOWNLOAD]

THERMAL BEHAVIOR OF SEWAGE SLUDGE DERIVED FUELS

