THERMAL SCIENCE
International Scientific Journal

Emmanuele Kakaras, Panagiotis Grammelis, George E. Skodras, Panagiotis Vourliotis

FLUIDIZED BED COMBUSTION WITH THE USE OF GREEK SOLID FUELS

Authors of this Paper
Related papers
Cited By
External Links

ABSTRACT

The paper is an overview of the results obtained up to date from the combustion and co-combustion activities with Greek brown coal in different installations, both in semi-industrial and laboratory scale. Combustion tests with Greek lignite were realised in three different Circulating Fluidized Bed Combustion (CFBC) facilities. Low rank lignite was burned in a pilot scale facility of approx. 100kW thermal capacity, located in Athens (NTUA) and a semi-industrial scale of 1.2 MW thermal capacity, located at RWE's power station Niederaussem in Germany. Co-combustion tests with Greek xylitic lignite and waste wood were carried out in the 1 MWth CFBC installation of AE&E, in Austria. Lab-scale co-combustion tests of Greek pre-dried lignite with biomass were accomplished in a bubbling fluidised bed in order to investigate ash melting problems. The obtained results of all aforementioned activities showed that fluidised bed is the appropriate combustion technology to efficiently exploit the low quality Greek brown coal either alone or in conjunction with biomass species.

KEYWORDS

fluidized bed, co-combustion, boilers, lignite

PAPER SUBMITTED: 2003-05-28

PAPER REVISED: 2003-07-22

PAPER ACCEPTED: 2003-09-04

CITATION EXPORT: view in browser or download as text file

THERMAL SCIENCE YEAR 2003, VOLUME 7, ISSUE 2, PAGES [33 - 42]

REFERENCES [view full list]

1. Kakaras E. and Vourliotis P., March 1995, "Pollutant Emissions from Circulating Atmospheric Fluidized Beds", Journal of the Institute of Energy, 68, pp 22 - 31.
2. Skodras G., Grammelis P. and Kakaras E., 2002, "Emissions During Co-combustion of Lignite and Waste Wood in Fluidised Beds", Proceedings, International Conference on New and Renewable Energy Technologies for Sustainable Development, S. Miguel Island, Portugal.
3. Kakaras E., Vourliotis P. and Grammelis P., 1999, "Fossil fuels combined combustion with biomass in a fluidised bed combustor", Mediterranean Combustion Symposium, Antalya,

Turkey.
4. Wang X. S., Gibbs B. M. and Akhtar N. A., 1993, "Abatement of NOx emission from a circulating fluidized bed combustor", 2nd Int. Symposium on Combustion Technologies for a clean Environment, Lisbon.
5. Koenig J., Klinge T. and Schimkat A., 1994, "Emissions of N2O by Coal Combustion in a 1.2 MWth Circulating Fluidized Bed Combustor", 6th International Workshop on Nitrous Oxide Emissions, Turku/Abo, Finland.
6. E. Kakaras, P. Vourliotis, P. Grammelis, 13-16 May 2001, "Co-combustion of lignite with waste wood in a lab-scale fluidised bed", 16th International Conference on Fluidized Bed Combustion (ASME Conference), Reno, Nevada, USA.
7. Erguedenler A. and Ghaly A. E., "Agglomeration of silica sand in a fluidized bed gasifier operating on wheat straw", Biomass and Bioenergy, Vol. 4, 1993, pp. 135-147.
8. Grubor B. D., Oka S. N., Ilic M.S., Dakic D.V and Arsic B.T., "Biomass FBC combustion - bed agglomeration problems", Proc. of the 13th Int. Conf. on FBC, Vol. 1, (ed. Heinschel K. J.), 1995, pp. 515-522.

FLUIDIZED BED COMBUSTION WITH THE USE OF GREEK SOLID FUELS