THE USE OF SOME AGRICULTURAL WASTE IN THE PREPARATION OF INSULATING FIRE BRICKS

By

Ali Mohamed Ali Hassan

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of

Doctor of Philosophy

In

Chemical Engineering

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Under the Supervision of

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Title of Thesis:

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Key Words:
Agricultural waste, Bagasse, Wheat straw, Polystyrene, Refractories

Summary:

Insulating fire bricks were prepared by the addition of one of two types of agricultural wastes, namely bagasse, the fibrous residue from sugar cane processing and wheat straw residue. These wastes were first sun dried, shredded then mixed with polystyrene (PS) beads as pore forming agent to be finally added to local Egyptian clay (kaolin). Shaped cubic samples of bricks (60×60×60 mm^3) were thus prepared, dried overnight then fired. Brick samples were heated to temperatures which varied between 900 and 1250°C for 6 h, with a heating rate of 2.5°C/min until 650°C, and then at 5°C/min until 900°C, 1000°C and 1250°C. The effect of varying PS and bagasse or PS and wheat straw content on the fired bricks was investigated.

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Dedication

TO MY PARENTS AND MY LOVED WIFE AND SONS

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