بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



شبكة المطومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها على هذه الأفلام قد أعدت دون أية تغيرات



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بعض الوثائـــق الاصليـة تالفـة

بالرسالة صفحات لم ترد بالاصل

SPRAY MEASUREMENTS OF COAL WATER SLURRY PRODUCED BY AN EFFERVESCENT ATOMIZER

Eng. Ahmed Samir Mohamed khalil
B. Sc. in Aircraft Mechanical Engineering

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

MASTER OF SCIENCE

in MECHANICAL POWER ENGINEERING

FACULTY OF ENGINEERING CAIRO UNIVERSITY GIZA, EGYPT JUNE 2005

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Ahmed Samir M. Khalil

ABSTRACT

The present study is concerned with the atomization of coal water slurry (CWS), which is used as a fuel in many engineering applications that utilize cheap coal as a potential substitute to oil.

The main objective of the present work is the experimental investigation of Coal-Water Slurry (CWS) with coal particle sizes of 75 & 250 µm is presented in thesis. Axial and radial distributions of the Sauter Mean Diameter (SMD) and average spray velocity using an effervescent atomizer is presented. The effects of air liquid ratio and atomizing pressure are considered. All experiments are performed at normal ambient atmospheric conditions using a Phase Doppler Particle Analyzer system (PDPA). The tested CWS contained 25% coal by weight. The air to liquid ratio (ALR) varied from 0.02 to 0.1. Results for water only (without coal particles) are obtained and considered as a base for the CWS results. The mass flow rate for both water only and CWS is kept the same at 5.2 g/s. The atomizing air pressure varied from 2 to 4 bar.

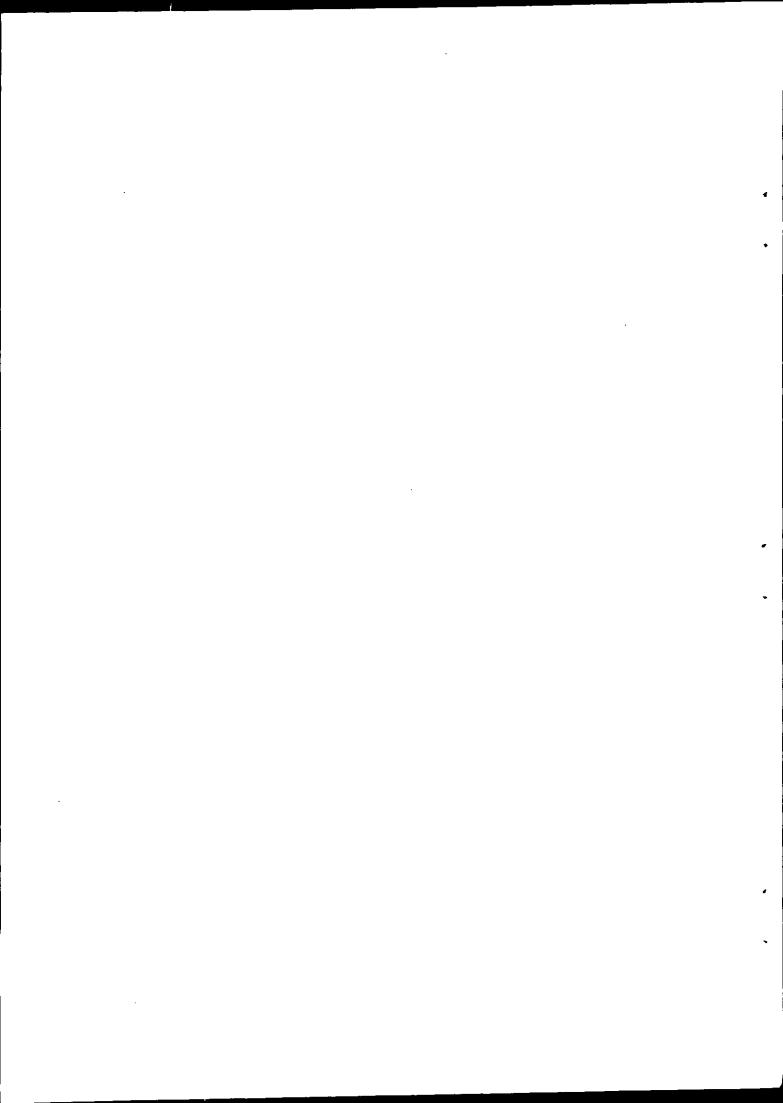
The results show an increase in SMD and a decrease in droplet velocity with the increase of the radial distance towards the spray edge and away from the centerline. A decrease in SMD with the increase of ALR is observed up to a value of 0.4. Behind this value, the ALR has a very little effect. A weak dependence of SMD on discharge pressure is observed. The results also show that the SMD of CWS having coal particles of smaller size is higher than SMD of CWS having coal particles of larger size. The results also show that CWS having coal particles of larger sizes is closer to the water only results than CWS having coal particles of smaller sizes.

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