بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات
لم ترد بالاصل

620,1

SPRAY MEASUREMENTS OF COAL WATER SLURRY PRODUCED BY AN EFFERVESCENT ATOMIZER

by

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

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MECHANICAL POWER ENGINEERING

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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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