بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / سلوي محمود عقل

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Cairo University

INVESTIGATING THE SURFACE CHANGES UNDER DIFFERENT GRINDING CONDITIONS AND THEIR IMPACT ON OIL SHALE FLOTATION

By

Nesren Mohamed KhairyAbd El-Aziz Khalf

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
MINING ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

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Key Words:
Oil shale; Surface change; Grinding; Flotation; Heating.

Summary:

Oil shale surface sensitivity is one of the challenging problems. Therefore, the oil shale breakage, as well as its surface characteristics, was studied under different applied grinding loads in terms of the number of balls, ball diameter, grinding time, and density of balls (steel and ceramic) and fitted to first and second grinding kinetic laws. Although the d_{50} size decreases with increasing the applied load and time, the higher the load is the less the flotation performance. In addition, matching the FTIR spectra for heated oil shale samples surface with those for the ground product at different conditions indicated that the grinding zone temperature does not exceed 150 ºC with high oil shale oxidation with finer grinding. Furthermore, FTIR and Zeta potential indicated that although there is no organics release, the fine particles coating leads to bad flotation results. Finally, grinding and flotation mechanisms were suggested.

Disclaimer

I hereby declare this thesis is my original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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Dedication

This thesis is dedicated to my beloved family who has meant and continues to mean so much for me. First to my mother, whose love, support, and encouragement have meant to me so much. She is my source of inspiration and always gives me strength when I am almost giving up. To my father who is no longer of this world, his memories continue to regulate my life. whose love for me knew no bounds and, who taught me the value of hard work. To my brother and sister, who shared their words of advice and encouragement during the challenges of study and life. I am truly thankful for having you in my life. my wonderful sister's kids as they are the joy to me.

I dedicate this work and give special thanks to my best friend Ghada for being there for me. I also dedicate this dissertation to my friends at the mining department, Ola, Tahany, Reham, Amr, and Raweya, whom have supported me throughout the study, especially Ola for her overall help and support. Also, I would like to thank my friends at NARSS Esraa, Mona, Rasha, Naglaa, Shaima, Hossam, and Khaled for all they have done to me.

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