

CELEBRATING
COMMERCIALISATION
YEAR 2014

iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention
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exposition 2014

INNOVATEUR
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2014

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA

*Bridging
the valley of death :
advancing the
commercialisation
of research*

RESEARCH BOOK

iiindex2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

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FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed
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LEMONGRASS FIBRE AS LOST CIRCULATION MATERIAL IN DRILLING FLUID

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In oil and gas industry, mud is used to help drilling operation to reach the desirable target in reservoir with different types of formations and challenges to extract the oil or gas to the surface. The functions of drilling mud are (1) to suspend cuttings to prevent it sagging at the drill bit during shutdown, (2) to transport it to the surface, (3) to cool and lubricate the drill bit, (4) to provide enough hydrostatics pressure to prevent fluids from formation enter to the wellbore and (5) to form a thin filter cake to seal the damage formation. Lost circulation is one of the most troublesome problems encountered in drilling due to uncontrolled flow of drilling fluid into the formation that is likely to happen due to ineffective filter cake. The smaller particles of drilling fluid are able to break through into the larger void spaces in the formation which lead to lost circulation. The industry uses millions of dollars a year to solve lost circulation. The negative effects of lost circulation are blow-outs, stuck pipe, lost rig time and the leasing of wells. Lost circulation materials (LCM) are drilling fluid additives that are designed to make sure that the drilling fluid circulated down the hole and return to surface for recirculation rather than loss to the formation drilled. There is a wide range of LCM that is currently being applied, depending on the viability of materials and loss rates, ranging from particles, flakes and cement gunk to chemical sealants. LCM selection is usually based on cost, nature of losses, types of drilling fluid being used and sometimes on the type of formations being drilled. Thus, fibrous materials are recognized to be used as lost circulation material (LCM) in drilling fluid to prevent loss of circulation. Nowadays, most of operator interested in the ultra-deep water due to the limitation of reserves and deals with high temperature and high pressure conditions. Oil based mud (OBM) is more preferable in high temperature conditions compared to water based mud hence a laboratory study was carried out to investigate the effect of temperature on the performance of lemongrass with different sizes of LCM in oil based mud. Evaluation on the filter cake and filtrate were also determined by using filter press. It was found that different temperatures and sizes have great effects on the lemongrass LCM in the oil based mud. The optimum temperature for lemongrass LCM is 275°F and with the sizes of 250 microns. Based on the result, it shows that lemongrass is able to perform a good LCM in OBM based on filtrate volume and filter cake thickness. The thickness of the filter cake obtained was in the range of 2 to 25 mm which satisfies the requirement from industry. The findings also discovered that the lemongrass with the size of 150 microns is the suitable material to be used as LCM to replace conventional LCM.