

LABORATORY PREPARATION OF WHITE CEMENT AND ITS  
ANALYSIS

NIK AZLI BIN ABDUL HALIM

FACULTY OF SCIENCE AND TECHNOLOGY  
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY MALAYSIA  
UNIVERSITI PUTRA MALAYSIA

2002



1100024706

q/w 1285

LP 31 FST 4 2002



1100024706

Laboratory preparation of white cement and its analysis / Nik Azli Abdul Halim.



PERPUSTAKAAN  
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
21030 KUALA TERENGGANU

1100024706		

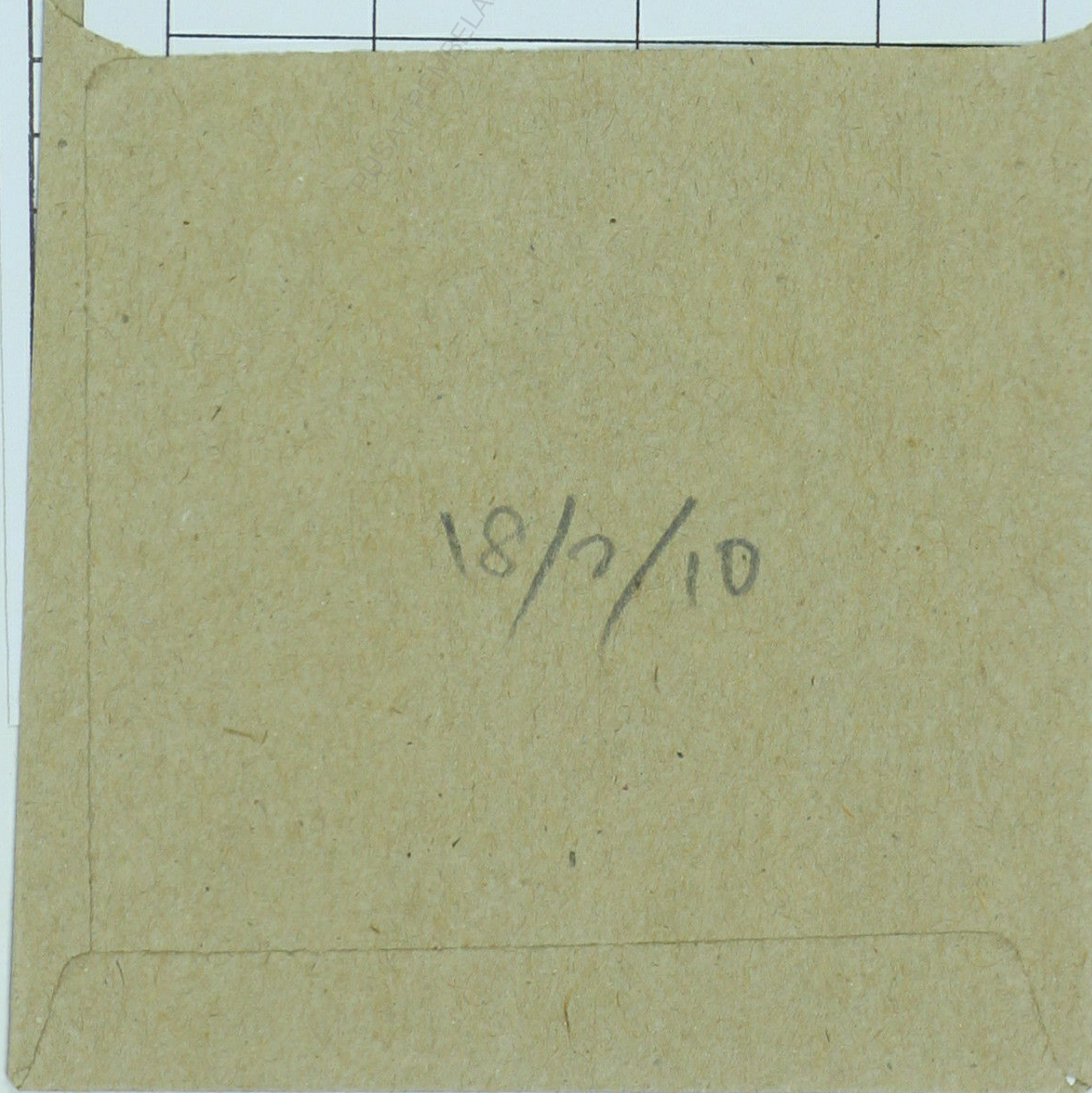
1100024706

PERPUSTAKAAN  
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
(KUSTEM)

Pengarang: *NIK AZLI ABDUL HALIM* No. Panggilan: *LP 32*

Judul: *Laboratory preparation of white cement and its analysis - P.S.T.*

Tarikh	Waktu Pemulangan	Nombor Ahli	Tanda tangan



LP  
31  
FST  
4  
2002

HAK MILIK  
PERPUSTAKAAN KUSTEM



**LABORATORY PREPARATION OF WHITE CEMENT AND ITS  
ANALYSIS**

**By**

**NIK AZLI BIN ABDUL HALIM**

**Thesis submitted in partial fulfillment of the requirement for the Bachelor  
of Science (Hons.) in Chemistry**

**FACULTY OF SCIENCE AND TECHNOLOGY  
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY  
MALAYSIA  
UNIVERSITI PUTRA MALAYSIA**

**2002**

**1100024706**

# LABORATORY PREPARATION OF WHITE CEMENT AND ITS ANALYSIS

By

NIK AZLI BIN ABDUL HALIM

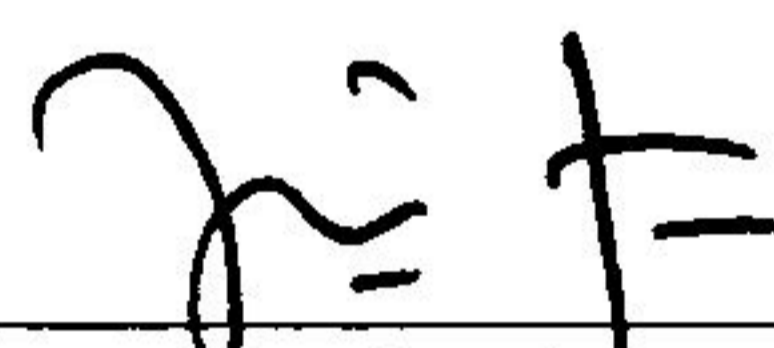
Approved By:

Supervisor

  
(Dr. Misbahul M. Amin)

Date: 04.04.2002

Project Coordinator

  
(En Suhaimi B. Suratman)

Date: 4/4/02

Acting Head of Department of Chemical Sciences

  
(Prof. Dr. Law Ah Theem)

Date: 13/4/02

PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH



## **ACKNOWLEDGEMENT**

I would like to take this opportunity to express my almost appreciation and sincere gratitude to my supervisor, Dr. Misbahul Mohd Amin for his guidance and advise throughout the course of this project.

A special thanks to the Dr. M.P Devandran, General Manager Operations; Mr. M.K.S Maniam, Quality Control Manager; Mr. Tambusamy, Quality Control Executive; Mr. Ong Pang Tuan, Chemist and to all the members of Pahang Cement Sdn. Bhd for their assistance, constructive comments and advise in this project.

Besides, I also would like to give my appreciations and thanks to all my housemates, Lihin, Zamri, Nayi and Boss; my best friends, Nordin, Azlan, Zani, Faizal, Nudman, Jenal, Dila, Kak Iza and Kak Nani and to all my coursemates for all their kindness, support and cooperation in helping me. Not forgetting to Cheok and Izan who helped me in this project.

Last but not least, I wish to thank to all my family, especially my parents Mrs. Engku Azizah and Mr. Mohd Nor, my brothers and sister; Raja Azhar, Nik Mohd Azri and Nik Anis for all your support, care and concern. Thank you for everything. May God bless you all.



## ABSTRACT

This research is to prepare white cement using chemical to find out the best composition. 4 main compounds of chemical for producing white cement are CaO, SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> and Fe<sub>2</sub>O<sub>3</sub> with 65.68%, 22.71%, 5.47% and 0.33% respectively. The tests that have been done are loss of ignition, free lime and x-ray fluorescence test, for chemical test while for the physical tests are sieve residue, setting time, soundness and fineness test. The soundness test showed no expansion happen while the loss of ignition, free lime, residue and setting time tests showed a higher values than the ordinary white Portland cement. The value for fineness test were 280, 330 and 390 m<sup>2</sup>/kg were within the ASTM range (200 - 600 m<sup>2</sup>/kg) and Malaysia Standard Speciation but still not suitable for commercial use. Test results indicated that the cement sample should be prepared finer, heating at higher temperature (1280°C-1540°C) and storage properly before testing.



## ABSTRAK

Kajian ini dijalankan untuk menyediakan simen putih menggunakan bahan kimia bagi mendapatkan komposisi yang terbaik. Empat bahan kimia utama yang diperlukan untuk menghasilkan simen putih adalah  $\text{CaO}$ ,  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  dan  $\text{Fe}_2\text{O}_3$  dengan komposisi bagi tiap-tiap bahan kimia adalah 65.68%, 22.71%, 5.47% dan 0.33%. Ujian-ujian yang telah dilakukan ke atas sampel ialah ujian kehilangan jisim sampel (loss of ignition), ujian kapur bebas (free lime) dan analisa komposisi sampel (x-ray fluorescence) bagi ujian sifat kimia dan ujian penentuan sifat fizik yang dilakukan adalah ujian baki ayakan (sieve ayakan), masa pemejalan (setting time), pengembangan atau pengecutan (soundness), dan ujian kehalusan saiz partikel (fineness). Ujian 'soundness' menunjukkan tiada pengembangan berlaku sementara itu bagi ujian kapur bebas, kehilangan jisim sampel, masa pemejalan dan baki ayakan menunjukkan peratusan yang lebih tinggi berbanding peratusan bagi simen putih biasa. Nilai bagi ujian kehalusan adalah 280, 330 dan 390  $\text{m}^2/\text{kg}$  dan nilai ini berada dalam piawaian ASTM iaitu 200 hingga 600  $\text{m}^2/\text{kg}$  serta Spesifikasi Piawaian Malaysia tetapi tidak sesuai untuk kegunaan komersil. Keputusan ujian menunjukkan bahawa sampel mesti disediakan lebih halus, dibakar pada suhu yang lebih tinggi ( $1280^\circ\text{C}$ - $1540^\circ\text{C}$ ) dan disimpan dengan elok sebelum melakukan ujian ke atas sampel.