

PREPARATION OF PORTLAND CEMENT IN LABORATORY  
AND ITS ESTIMATION OF PRODUCTS

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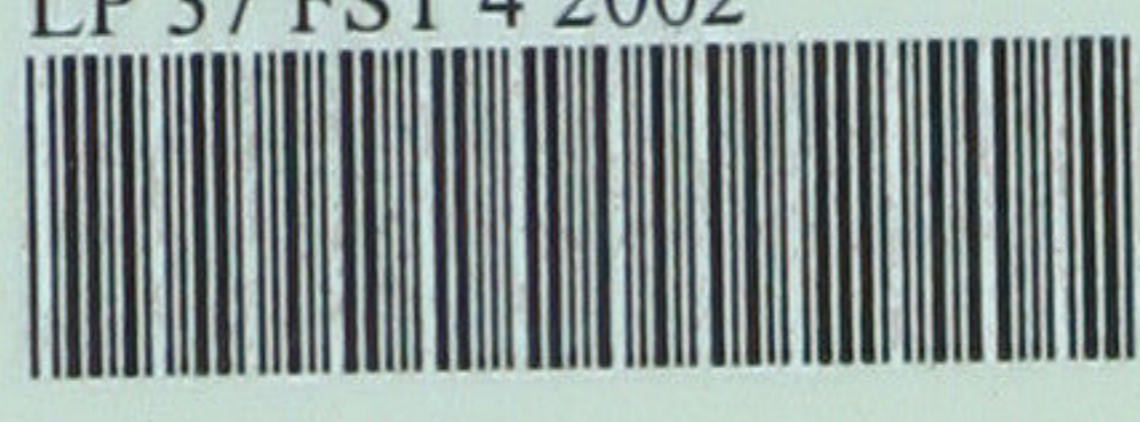
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# PREPARATION OF PORTLAND CEMENT IN LABORATORY AND ITS ESTIMATION OF PRODUCTS

By:

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Thesis submitted in partial fulfillment of the requirement for the  
Bachelor of science (Hons)-Chemistry

PUSAT PEMBELAJARAN DIGITAL SUKSES ZAHIRAH

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PREPARATION OF PORTLAND CEMENT IN LABORATORY AND  
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## **ABSTRACT**

The study of the project is the production of Portland cement in laboratory. The raw materials that have been used are calcium oxide (CaO), silica (SiO<sub>2</sub>), alumina (Al<sub>2</sub>O<sub>3</sub>) and iron oxide (Fe<sub>2</sub>O<sub>3</sub>). The raw materials are mixed to each other. The oxides were mixed and burnt in an electric furnace at 1100<sup>o</sup>C.

The preparation of cement in lab will compare to the Ordinary Portland cement of commercial cement. The result showed that the cement samples are considerable appreciable than ordinary Portland cement manufactured commercially. All the results after the tests for each sample are higher than standard cement. For example, the volume of free lime that not reacts during burning process is 0.9 % ordinary Portland cement. While, at the laboratory prepared cement contains 1.3 % and 1.5 % of free lime in the both samples are not react during burning process.

The cement samples test is done in laboratory at Pahang Cement. Sdn. Bhd. However, the results that have been getting are closely to the standard cement. But, the qualities of the cement samples are nearly good as ordinary Portland cement, commercially available

## ABSTRAK

Kajian yang dibuat dalam projek ini penghasilan simen Portland di dalam makmal. Kandungan bahan mentah yang telah digunakan ialah kalsium oksida (CaO), silika (SiO<sub>2</sub>), alumina (Al<sub>2</sub>O<sub>3</sub>) dan besi oksida (Fe<sub>2</sub>O<sub>3</sub>). Bahan mentah yang digunakan dicampurkan antara satu sama lain. Kesemua oksida yang telah dicampur dan dibakar di dalam relau elektrik pada suhu 1100<sup>o</sup>C campuran tersebut kemudian akan dibakar di dalam relau yang bersuhu.

Penyediaan simen di dalam makmal dibandingkan dengan Portland simen biasa (ordinary Portland cement) yang dihasilkan secara komersial. Keputusan yang diperolehi adalah menunjukkan bahawa simen sampel kurang baik daripada Portland simen biasa. Kesemua keputusan menunjukkan peratusan ujian bagi setiap sampel adalah lebih tinggi daripada yang sepatutnya diperolehi. Contohnya, nilai bagi peratus ujian kandungan kapur bebas yang tidak bertindakbalas semasa pembakaran ialah 0.9 % bagi Portland cement biasa. Manakala, keputusan bagi kedua-dua sampel ialah 1.3 % dan 1.5 % kandungan kapur bebas yang tidak bertindakbalas semasa pembakaran.

Ujian ke atas sampel yang dilakukan di makmal Pahang Cement Sdn. Bhd. Walau bagaimanapun, keputusan yang diperolehi adalah lebih kurang sama dengan Portland cement biasa. Tetapi, kualiti simen sampel tersebut tidak sebaik simen Portland biasa dan komersial.