بسم الله الرحمن الرحيم

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%

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

Physico-Chemical Studies on Polymer Impregnated Blending Cement Mortar Composite

A Thesis

Submitted for Partial Fulfillment
of the Requirements for the Degree of Philosophy
of Science (Ph.D.)
(Chemistry)

By

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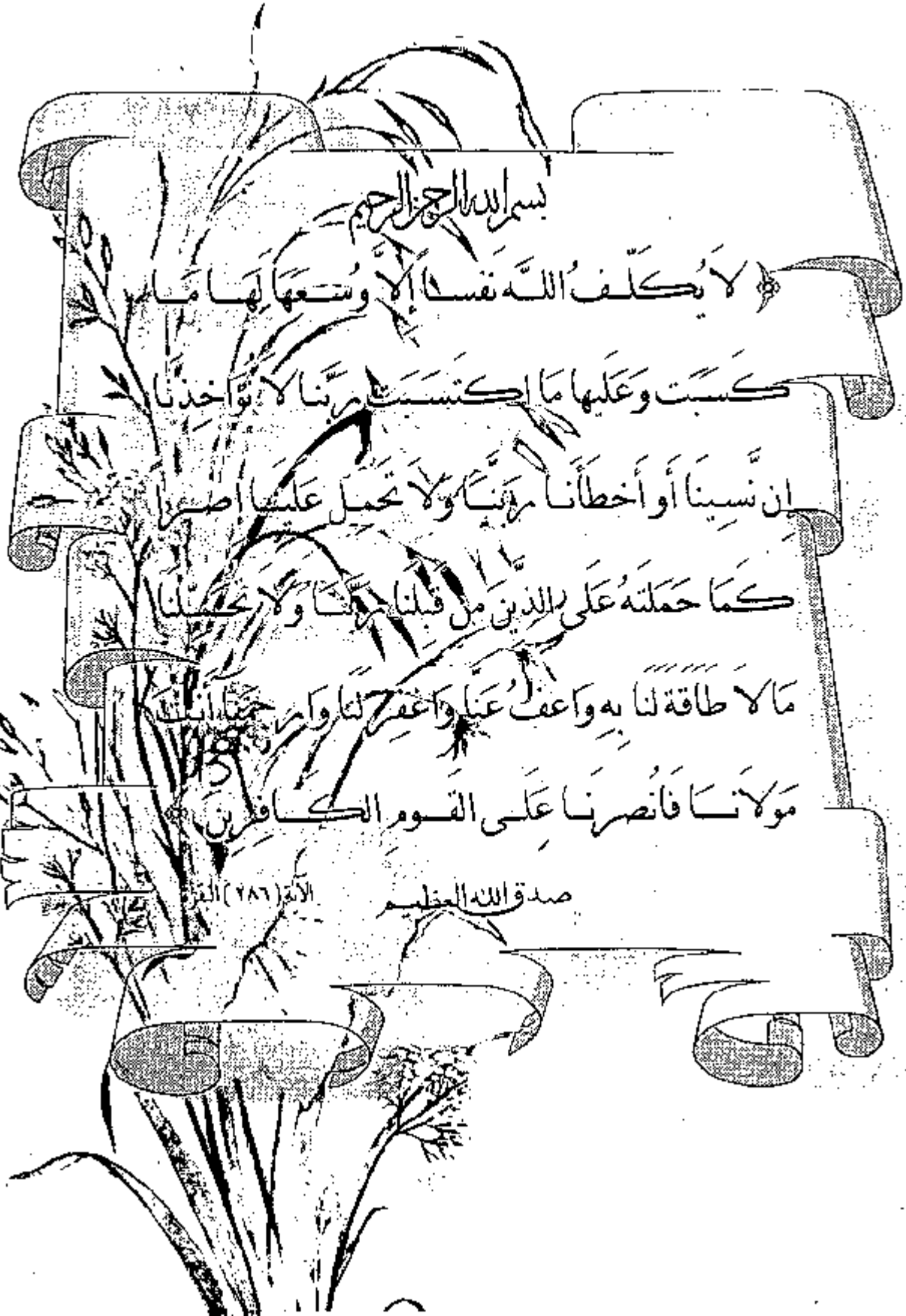

بسم الله الرحمن الرحيم

﴿ لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا لَهَا مَا
كَسَبَتْ وَعَلَيْهَا مَا اكْتَسَبَتْ رَبَّنَا لَا تُؤَاخِذْنَا
إِنْ نَسِينَا أَوْ أَخْطَأْنَا رَبَّنَا وَلَا تَحْمِلْ عَلَيْنَا إِصْرًا
كَمَا حَمَلْتَهُ عَلَى الَّذِينَ مِنْ قَبْلِنَا رَبَّنَا وَلَا تُحَمِّلْنَا
مَا لَا طَاقَةَ لَنَا بِهِ وَاعْفُ عَنَّا وَاغْفِرْ لَنَا وَارْحَمْنَا أَنْتَ
مَوْلَانَا فَانْصُرْنَا عَلَى الْقَوْمِ الْكَافِرِينَ ﴾

صدق الله العظيم الآية (٢٨٦) البقرة

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Aim of Work

As the increasing of the demand on a specific performance characteristics in concrete such as improved strength, low heat, sulfate resistance, improved impermeability and certain other applications. Some of the industrial waste materials such as the blast-furnace slag, silica fume and fly ash were mixed with the cement clinker to produce blended cement. The use of these materials modifies the strength, pore structure and permeability of hardened cement mortar or concrete. The incorporation of blast-furnace slag and silica fume in the hardened blended cement mortar or concrete is a common practice recently due to technological, economical and environmental benefits.

The present work aims to study the chemical resistance properties of blended cement mortars towards sulfate attack in order to produce more durable mortar or concrete towards the environmental conditions. The effect of aggressive media on physico-chemical and mechanical properties of the blended cement mortars has been studied.

In order to enhance the mechanical properties of these blended cement mortars or concrete by reducing their prosities as low as possible and producing a more dense material inside the specimens the polymer-impregnation technique is applied on the hardened blended cement mortars. These hardened cement mortar specimens impregnated with unsaturated polyester resin containing 40% styrene monomer and its emulsions, made with different water contents. This was followed by gamma-irradiation to induce free radical chain growth cross-linking co-polymerization reaction of unsaturated polyester resin and styrene monomer.

The physico-chemical properties of hardened Portland slag cement mortar composites are investigated in terms of cured polymer, compressive strength, bulk density, total porosity and water absorption. Moreover, cross-linking density, swelling ratio, soluble and gel fraction are examined. Certain kinetic parameters such as activation energy, which can be used to provide a better understanding to the thermal stability of polymers, were investigated by using thermogravimetric analysis (TGA). Also, the infrared (IR) spectra and scanning electron microscopy (SEM) studies were carried out on some samples to confirm the results of physico-chemical properties of the hardened blended cement mortars which cured under different conditions.