

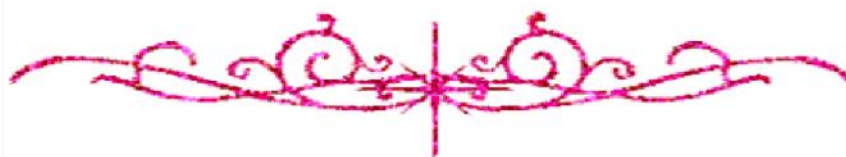
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بسم الله الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني



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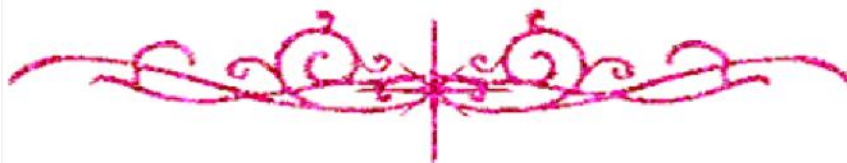
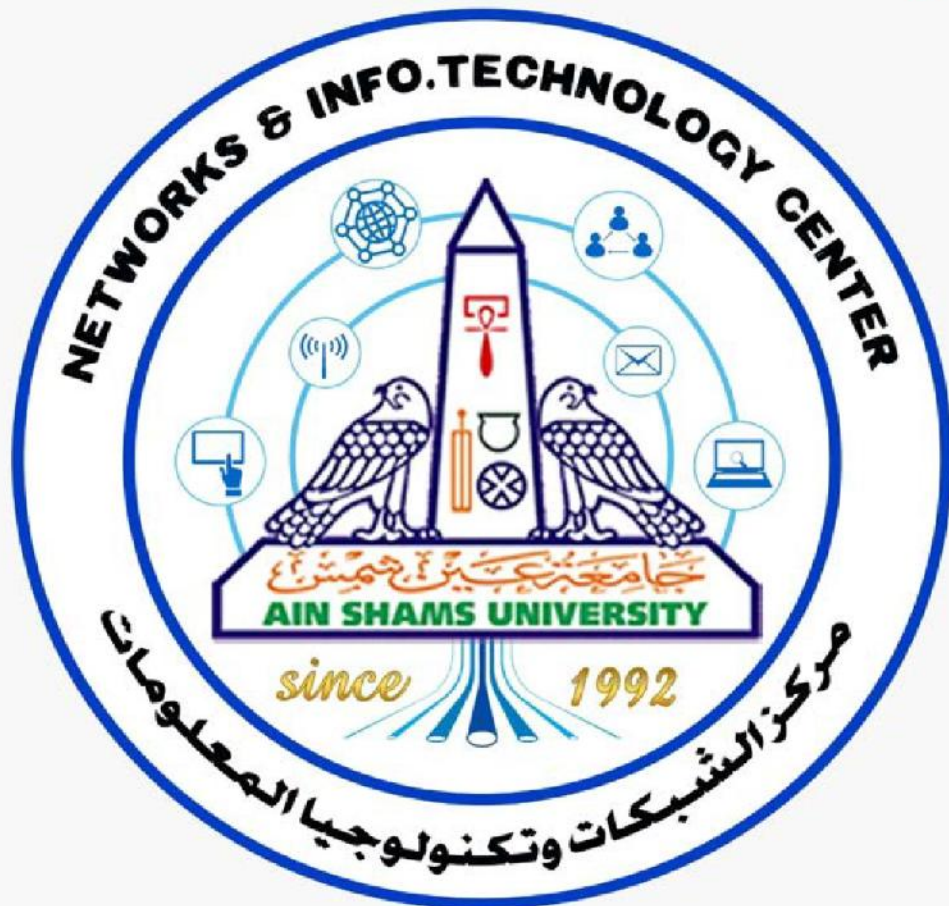
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التوثيق الإلكتروني والميكرو فيلم

قسم

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THE EFFECT OF USING NANO TITANIUM AS A PARTIAL REPLACEMENT OF CEMENT ON THE MECHANICAL PROPERTIES AND PHOTOCATALYTIC PROPERTIES OF MORTAR

By

Rania Adel Ali Khalil

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfilment of the
Requirements for the Degree of
MASTER OF SCIENCE
In
Structural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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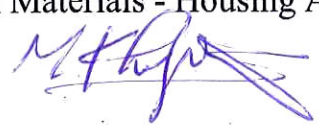
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Title of Thesis:

The Effect of Using Nano Titanium as a Partial Replacement of Cement on the Mechanical Properties and Photocatalytic Properties of Mortar

Key Words:

Nano material, Nano Titanium, agglomeration, dispersion, photocatalytic.

Summary:

This research aims to study the effect of adding Nano titanium (TiO_2) on the mechanical properties and photocatalytic properties of cement mortar. To achieve these goals, three different percentages of Nano TiO_2 were investigated. 2%, 3%, and 4% by Wt. of cement. Compressive strength, Flexural strength, and Splitting strength were measured. Different method of dispersing Nano TiO_2 were investigated to reach the optimum utilization of Nano materials. In addition, the effect of adding Nano TiO_2 on the photocatalytic properties of cement mortar was investigated. The study showed that Nano TiO_2 has a significant effect on the photocatalytic process, which gives the mortar new properties in the process of self-cleaning.

DISCLAIMER

I hereby declare that this thesis is my own 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.

Name: Rania Adel Ali Khalil

Date: / / 2022

Signature:

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IN THE NAME OF ALLAH, THE MOST GRACIOUS AND THE MOST MERCIFUL

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DEDICATION

To My Mum, My Dad & My Husband, My family

that has a great effect on my life.

All my love to you for your care and support.

TABLE OF CONTENTS

Acknowledgments.....	II
Dedication	III
Table of Contents	IV
List of Tables	VI
List of Figures	VII
ABSTRACT.....	IX
CHAPTER ONE : INTRODUCTION	1
1.1. General.....	1
1.2. Objectives	3
1.3. Scope of Work	3
1.4. Thesis Layout	4
CHAPTER TWO : Literature Review	5
2.1. Introduction	5
2.2. General Review about Nanotechnology	6
2.3. Technical background on nanoparticles application in concrete.....	7
2.4. The effect of using Nano-titanium in concrete mortar on the Concrete mechanical and durability	9
2.5. Factors Affecting Nanomaterial Behavior as Cement Substitution	10
2.6. Mixing and dispersion methods.....	13
2.7. THE EFFECT OF USING NANO TIO ₂ ON THE PROPERTIES OF CONCRETE	14
2.8. Self-Cleaning concrete	17
CHAPTER THREE : Experimental program.....	19
3.1. General.....	19
3.2. Overview of Experimental Program.....	19
3.3. Characterization of Used Material.....	22
3.2.1. Cement	22
3.2.2. Fine aggregate	22
3.2.3. Nano Titanium	23
3.2.4. Water.....	24
3.2.5. Super plasticizer.....	24

3.4. Mixtures Preparation	25
3.3.1. Dispersion devices	26
3.3.2. Curing	31
3.5. Testing	32
3.5.1. Hardened concrete test.....	32
3.5.2. Durability test	36
CHAPTER FOUR : Results and Discussion.....	41
4.1. Introduction	41
4.2. Microstructure Properties of Nano titanium Concrete	41
4.3. Mechanical Properties of Nano TiO ₂ Concrete	42
4.3.1. Compressive Strength of Nano TiO ₂ Concrete	42
4.3.2. Flexural Strength of Nano TiO ₂ Concrete.....	46
4.3.3. Splitting Tensile Strength of Nano TiO ₂ Concrete	47
4.4. The effect of different dispersion Techniques for Nano TiO ₂ in mortar:	48
4.5. Comparison between Mechanical properties of mortar using starting and optimum dispersing technique:	49
4.5.1. Compressive Strength	49
4.5.2. Flexural Strength 28 days	51
4.5.3. Splitting Tensile Strength 28 days	52
4.6. Durability test	53
4.6.1. Self-Cleaning test.....	53
CHAPTER FIVE : Conclusion and Recommendations.....	58
4.7. Conclusion	58
4.8. RECOMMENDATIONS.....	58
REFERENCE.....	59

LIST OF TABLES

Table 3-1 : Chemical Composition of Portland Cement (wt%)	22
Table 3-2 Properties of TiO ₂ nanoparticles	23
Table 3-3 Polycarboxylate admixture physical and chemical characteristics	24
Table 3-4 Specifications and properties of the sonication bath.....	26
Table 3-5 rotor-stator homogenizer properties.....	28

LIST OF FIGURES

Figure 1-1 : Photocatalytic effect of titanium dioxide on pavement.....	2
Figure 2-1“top-down” Illustration the and “bottom-up” approaches in nanotechnology [1]	6
Figure 2-2 : Setting time of cement pastes	9
Figure 3-1 Experimental plan.....	21
Figure 3-2 Fine aggregates sieve analysis in comparison with the limits of the Egyptian code of practice.....	22
Figure 3-3 TEM images of TiO ₂ nanoparticles	23
Figure 3-4 XRD spectrum of TiO ₂ nanoparticles	24
Figure 3-5 : Schematic representation of a multiphase suspension dispersed through different mechanisms exercised by super plasticizer	25
Figure 3-6 The Ultrasonic sonication bath device, LBS2 model	26
Figure 3-7: (rotor-stator) homogenizer.....	27
Figure 3-8 Homogenizer work with the sonication bath at the same time	28
Figure 3-9: Steel molds which their inner sides coated with oil	29
Figure 3-10 Beaker contained nano TiO ₂ colloidal	30
Figure 3-11 Digital weight calibrations with different tolerance	30
Figure 3-12 : The mixer.....	31
Figure 3-13 : Water curing	31
Figure 3-14 Universal testing machine SHIMADZU 1000 kN.....	32
Figure 3-15 Compression strength test setup	33
Figure 3-16 : Flexural test setup.....	34
Figure 3-17 Splitting Tensile Strength test setup	35
Figure 3-18 : The water can't Breakthrough concert because the Surface not cleaned	36
Figure 3-19 : A thin layer of grease was applied on a Nano TiO ₂ concrete cubes surface.....	37
Figure 3-20 : A thin layer of car oil was applied on a Nano TiO ₂ concrete cubes surface.....	37
Figure 3-21 : The concrete cubes were put in glass jars containing Nitrogen and closed tightly	37
Figure 3-22 : The concrete cubes in glass jars were exposure to the sun rays during one month	38
Figure 3-23 Microscope fixed to be in a horizontal position	39

Figure 4-1 : Agglomeration of Nano TiO ₂ and its filling effect in concrete	41
Figure 4-2 Rolling effect of Nano TiO ₂ in concrete	42
Figure 4-3 Relationship between the 7 days compressive strength and different percentages of Nano titanium cured in normal water	43
Figure 4-4 Relationship between the 28 days compressive strength and different percentage of Nano titanium cured in normal water.....	44
Figure 4-5 : 90 days compressive strength using different percentages of Nano titanium cured in normal water	45
Figure 4-6 : 28 days Flexural Strength using different percentages of Nano titanium cured in normal water.....	46
Figure 4-7 : 28 days Splitting Tensile Strength using different percentages of Nano-titanium cured in normal water.....	47
Figure 4-8 : 28 days compressive strength using different type of dispersion on Nano titanium cured in normal water	48
Figure 4-9 Relationship between Control Mix, method (I) and method (V) on compressive strength for 7 days.....	49
Figure 4-10 Relationship between Control Mix, method (I) and method (V) on compressive strength for 28 days.....	49
Figure 4-11 Relationship between Control Mix, method (I) and method (V) on compressive strength for 90 days.....	50
Figure 4-12 : The effect of Nano TiO ₂ dispersing technique on the compressive strength of different ages	50
Figure 4-13 : 28 days flexural strength using different type of dispersion on Nano titanium cured in normal water	51
Figure 4-14 : 28 days splitting tensile strength using different type of dispersion on Nano titanium cured in normal water.....	52
Figure 4-15 : Before applying any layer on the surface of Nano TiO ₂ Concrete cube	53
Figure 4-16 : After applying a thin layer of grease on the surface of Nano TiO ₂ Concrete cube	54
Figure 4-17 After applying a thin layer of grease on the surface of Nano TiO ₂ Concrete cube and expose the cube to the sun for month	54
Figure 4-18 : After applying a thin layer of car oil on the surface of Nano TiO ₂ Concrete cube.....	55
Figure 4-19 After applying a thin layer of car oil on the surface of Nano TiO ₂ Concrete cube and expose the cube to the sun for month	55
Figure 4-20 : The final surface results are prove that the Nano-titanium has self-cleaning property	56

ABSTRACT

This research aims to study the effect of adding Nano titanium (TiO₂) on the mechanical properties and photocatalytic properties of cement mortar. To achieve these goals, three different percentages of Nano TiO₂ were investigated 2%, 3%, and 4% by Wt. of cement. Compressive strength, Flexural strength, and Splitting strength were measured. Different method of dispersing Nano TiO₂ were investigated to reach the optimum utilization of Nano materials.

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