A Study of Composite Formulations Containing Calcium Phosphate

Thesis Submitted to the Faculty of Oral and Dental Medicine, Cairo University in Partial Fulfillment of the Requirements of Doctor of Philosophy Degree in Basic Dental Science

(Dental Materials Science)

BY

Shaymaa Ibrahim Mohamed Habib

B.D.S (1999); M.sc. (2006) Cairo University

Assistant Lecturer, Department of Biomaterials

Faculty of Oral and Dental Medicine

Cairo University

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Supervisors

Prof. Dr. Taheya Ahmed Moussa

Professor of Dental Materials Science

Biomaterials Department

Faculty of Oral and Dental Medicine

Cairo University

Prof. Dr. Sayed Hussein seniour

Professor of Dental Materials Science

Head of Biomaterials Department

Faculty of Oral and Dental Medicine

Cairo University

Dr. Yasser El-Hanafy Greish

Assistant Professor

Ceramic Department, National Research Center

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Dedication

"To all whom I love"

Nomenclature

PMMA	Polymethyl methacrylate
MMA	methyl methacrylate
CP	Calcium phosphate
CPC	Calcium phosphate cement
α-TCP and β-TCP	alpha and beta-tricalcium phosphate
HAp	Hydroxyapatite
BCP	Biphasic calcium phosphate
TTCP	Tetracalcium phosphate
DCPA	Dicalcium phosphate anhydrate (Monetite)
DCPD	Dicalcium phosphate dihydrate (brushite)
MCPM	Monocalcium phosphate monohydrate
OXA	Oxyapatite
OCP	Octacalcium phosphate
ACP	Amorphous calcium phosphate
PHAp	Precipitated hydroxyapatite
CDHA	Calcium deficient hydroxyapatite
NIST	National Institute of Standards and Technology
ADA	American Dental Association
ADAHF-PRC	Health Foundation Paffenbarger Research Center
FDA	Food and Drug Administration
MSS	Molten Salt Synthesis
JCPDS	Joint committee of powder diffraction systems
XRD	X-ray diffraction
FTIR	Fourrier Transform Infra-Red
SEM	Scanning Electron Microscope
MIP	Mercury Intrusion Porosimetry
MSCs	Mesenchymal Stem Cells
ECM	Extracellular matrix
MW	Molecular weight
P/L	Powder to Liquid ratio
Ca/P	Calcium to Phosphorus ratio
Vol%	Volume percentage
Wt%	Weight percentage
ρ_{se}	Specimen's envelope density
V_{se}	Specimen's envelope volume
ρ_{sa}	Specimen's apparent density
V_{sa}	Specimen's apparent volume
σ_c	Compressive strength
μm	Micrometer

MPa	Mega Pascal
min	Minute
g	Gram
Å	Angstrom
µl	Microliter
µ	Surface tension of mercury
Θ	mercury's contact angle on composite surface

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