
بسم الله الرحمن الرحيم

Basic Dental Biomaterials Science

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P.O. Box 22480, Riyadh 11495, Saudi Arabia

1st print 1411 A.H. (1990).
2nd print 1416 A.H. (1995).

King Fahd National Library Cataloging-in-Publication Data

Al Tahawi, Hamdi Mohammed. Basic dental biomaterials science.

2nd print.

234 p, 17×24 cm.

ISBN: 9960-05-287-7 (pb)

9960-05-288-5 (hard)

1-Dental materials 2-Dentistry 1-Title

617.695 dc 0545/16

Legal Deposit no. 0545/16

This book has been refereed by a specialized committee appointed by the Academic Council of the University. After examining the reports of the referees, the Council authorized its publication in its 19th session of the academic year A.H. 1407-1408, which was convened on 4/7/A.H. 1406 (21/2/1986). The Council then authorized its reprinting in its 26th session of the academic year A.H. 1415-1416, which was convened on 5/2/ A.H. 1416 (3/7/1995).

King Saud University Press - A.H. 1416

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Chapter One: MATERIALS IN DENTISTRY

PREFACE

This book is meant for students of dentistry to provide the suitable background in materials science that will enable them to properly comprehend dental materials as a dynamic science. It is the first in a series of three books, the other two covering direct restorative materials and indirect restorative materials, respectively.

This book is assigned as reading material for Course SDS 261 (Basic Dental Materials) at King Saud University. The course is one credit hour (14 clock hours of lectures + 2 hours of examination).

An overview of the use of materials in dentistry is presented in this book, followed by a discussion of the dentally relevant physical properties, stress-strain relations, time dependent mechanical properties, surface chemistry, failure of materials in the oral environment, crystal structure and defects, phase diagrams, strengthening of metals, and introduction to ceramics and polymers.

Simple language and an abundance of visual illustrations is provided in this book to serve as self-instructional material for students whose primary language is English, and at the same time as a lecture assisted book for students whose primary language is not English.

A 1981 draft of this book embodies a chapter on Biomechanics (no longer included) which was compiled with the assistance of Dr. S. Tsutsumi of Japan. Chapter one of that draft (further revised) was compiled with the assistance of Dr. C. Shen of Florida. The assistance of Dr. F. Schoen of Massachusetts in the evolution of that draft has been most valuable. These efforts are gratefully acknowledged.

Two American experts were asked by the College of Dentistry to review the book in accordance with the university regulations. They made many significant suggestions which were included. The referees state "your book is the most important foundation for all discussions of Dental Materials. It includes all the key definitions and should be used as a course book. The text is extremely well written both in terms of English language and scientific definitions. As the student's first exposure, and his foundation for future advanced study in Dental Materials, this lecture assisted book should serve the serious student well. The

author provides an excellent organization of scientific topics. The author provides an excellent dental example of every scientific principle or definition presented. This is an outstanding approach. This text forms the scientific foundation for all practical discussions. The illustrations are excellent. They are well formulated and very easy to understand."

Ḥamdi Moḥammed–Al Taḥawi