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Smart Materials- A Review

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Abstract

The word "smart" refers to material that can sense changes in their environment and are responsive to these changes in a pre-requisite manner. Stimuli such as stress, temperature, moisture, pH, electric or magnetic field change the characteristics of these materials in a controlled fashion and also possess the ability to change their physical properties in a specific manner in responses to specific stimulus. In dentistry, there is no material that can be referred as ideal in nature and satisfies the properties of an ideal material. This paper attempts to highlights the use of "smart materials" to achieve a maximum advantage over conventional materials in dentistry.

Keywords: *Biosmart materials, Self healing composite, Cercon, Smart burs.*

Introduction

The research and development of newer and better materials is unending particularly in the field of dental science[1-2]. Materials utilized in dentistry can be categorized as bio-inert, bio-dynamic, and bio-responsive or smart materials dependent on their interactions with the environment.[3].

Early smart material applications began with magnetostrictive advancements.Because of the fascinating conduct of Smart materials, researchers were urged to apply them in different fields such biomedical science and dentistry[4].

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Smart materials have been around for quite a long time in dentistry, the initial term smart materials began from the 1980's. McCabe et al characterized, Smart materials as materials whose properties might be changed in a controlled design by stimuli, like pressure, stress, temperature, moisture, pH, and electric or magnetic fields[5]. Accordingly Smart behaviour happens when a material can detect and upgrade fromits current circumstance and respond to intentional or unintentional changes that it is subjected to, in a helpful, dependable, reproducible and generally reversible way. A truly smart material will utilize its response to the outside environmentto start or incite a functioning reaction.

CLASSIFICATION OF SMART MATERIALS

A survey of literature by us revealed the following classifications for smart materials relating to dentistry.