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The effect of Ag-Zn zeolite incorporation on some properties of condensation and addition silicone impression materials

A thesis

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Abstract

Statement of problem: The elastomeric impression materials are indicated when a high degree of accuracy is required, due to their excellent properties such as tear resistance, elastic recovery and dimensional stability, but with main disadvantage that they are hydrophobic rubber based materials, as well as to the absence of antibacterial action like all impression materials.

Aim of the study: The purpose of this study was to estimate the outcome of incorporation of 0.5% wt Ag-Zn zeolite into two types of elastomeric impression materials; condensation and addition silicone on the following properties; setting time, dimensional stability, reproduction of details, wettability and hardness.

Materials and method: Two hundred specimens were constructed; 100 of condensation silicone and 100 of addition silicone, for each group 50 specimen without addition and other 50 specimen with 0.5% wt Ag-Zn zeolite. Then each group was furtherly subdivided into 5 subgroups according to the conducted test. For each impression material and for each test, 20 specimens were prepared; 10 with addition of Ag-Zn zeolite and 10 without any addition.

Results : A statistically non significant effect on the setting time and reproduction of details of both materials used; condensation and addition silicone was observed after incorporation of 0.5% wt Ag-Zn zeolite, combined with a highly significant increase of wettability of both of materials used. A significant increase of dimensional change of addition silicone subsequent to incorporation of 0.5% wt Ag-Zn zeolite while with non-significant increase of dimensional change of condensation silicone. Following to incorporation of 0.5% wt Ag-Zn zeolite; the hardness of addition silicone was significantly increased while the hardness of condensation exhibit a highly significant increase.

Conclusion: Ag-Zn zeolite could be incorporated into addition and condensation silicone, leading to improving wettability, increasing hardness and without any effect on setting time and reproduction of details of both of them. On the other hand there was an increase of dimensional change of addition silicone as a result of 0.5% wt Ag-Zn zeolite incorporation.