

Influence of different nanoparticles in the properties of acrylic resin specific for ocular prosthesis

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Nanoparticles (NP) have been added to acrylic resins polymeric chains in order to improve their properties. However, there are no studies about the influence of such NP in the acrylic resins specific for ocular prosthesis. This study aimed to assess the influence of different NPs on color stability, microhardness, and flexural resistance of artificial sclera N1 acrylic resin. The NP used were Zinc Oxide (ZnO), Titanium Dioxide (TiO_2) and Barium Sulfate (BaSO_4), at concentrations of 1, 2 and 2%. Samples were divided into 10 groups (n=30), according to NP and concentration associated with resin: control – without NP (C); ZnO 1%, ZnO 1%, ZnO 2%, ZnO 2,5%, TiO_2 1%, TiO_2 2%, TiO_2 2,5%, BaSO_4 1%, BaSO_4 2%, BaSO_4 2,5%. Color stability, microhardness and flexural resistance tests were performed before and after 1008 hours of accelerated aging. Data were subjected to statistical analysis. The results showed that the groups with TiO_2 showed better color stability at all concentrations. Microhardness increased after artificial aging, except for groups C and ZnO; groups with TiO_2 at 1 and 2% showed the highest statistically significant values compared with the other NP. Regarding flexural strength, at initial period, there was statistically significant difference between group C and the other groups. Groups C and with TiO_2 showed statistically significant lowest flexural strength values after aging, regardless concentration. It is concluded that NP directly influenced the properties of acrylic resin and TiO_2 was the most influential nanoparticle over the properties evaluated.

Keywords: Nanoparticles; Acrylic Resins; Eye; Artificial.



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