

**TÍTULO:** DEVELOPMENT OF A SELF-CURED ACRYLIC RESIN NANOCOMPOSITE WITH CHLORHEXIDINE LOADED-HALLOYSITE NANOTUBES FOR DENTAL APPLICATIONS

**AUTOR:** Isabelle da Costa Goes Timbó

**EMAIL:** isabellegoes@alu.ufc.br

**COAUTORES:** Mayara Soares Cardoso Sales Oliveira, Ramille Araújo Lima, Pierre Basílio Almeida Fechine

**ORIENTADOR:** Rômulo Rocha Regis

**INSTITUIÇÃO:** Universidade Federal do Ceará

**RESUMO:**

The incorporation of antimicrobials in dental materials has been investigated as a strategy for the prevention and treatment of oral diseases. This study aimed to synthesize halloysite nanotubes (HNTs) loaded with chlorhexidine (CHX) and incorporate them into a self-cured acrylic resin (SAR). The incorporation efficiency (IE) was calculated and the characterization of HNT/CHX was performed by means of morphological evaluations, Fourier transforms infrared spectroscopy and thermal analyses. SAR disks were made with concentrations of 0, 3, 5, and 10% of HNT/CHX. Spectral measurements ( $n=3$ ) were performed for up to 50 days to examine CHX release. Agar plates, with *Candida albicans* (CA) and *Streptococcus mutans* (SM), were used to measure the inhibition zones. Microhardness and color analyses ( $n=9$ ) were performed at baseline and after 30 days of immersion in distilled water. Finally, the surface topography was verified. Data were analyzed using ANOVA/Bonferroni and paired t-tests. The IE obtained was 8.15%. Samples with 10% showed controlled CHX release throughout the observed period. Antimicrobial activity was verified for CA and SM for all the test groups. After 30 days, the 10% group showed a significant increase in hardness ( $p<0.05$ ), and a progressive color change was observed ( $p<0.001$ ), within acceptability standards, with the increase in the concentration. The modification of the SAR showed a controlled CHX release, without compromising the evaluated properties.

**PALAVRAS-CHAVE:** Nanotubes. Chlorhexidine. Acrylic Resins. *Candida albicans*. *Streptococcus mutans*.