

THE EFFECT of THE AMOUNT of 3-METHACRYLOXYPROPYL-TRIMETHOXYSILANE on CREATING LINKS BETWEEN RESIN MATRIX and SYNTHESIZED APATITE GLASS CERAMIC POWDER WITHIN DENTAL RESIN COMPOSITES

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The purpose of this study was to evaluate the effect of the amount of 3-Methacryloxypropyl- trimethoxysilane (γ -MPS) coupling agent on some properties of an experimental resin composite for understanding the optimum amount of silanization. Apatite glass ceramic nano-particles which were synthesized in our laboratory by specific microstructures, used as filler. Moreover the flour release of these components prohibits the dental decay. Flour apatite powders were treated with γ -MPS using standard techniques in both polar and non polar systems. Fourier Transform spectroscopic Infraed (FTIR) results showed that the optimum amount of silane is about 2-4% silane. Series of experimental composites consisting of Biphonel-a-glycidyl methacrylate (BisGMA) based resin and treated flour apatite filler were produced. In order to study the progress of polymerization process, FTIR test was employed. Since the presence of water leads to the degradation of silane bonds, in order to simulate the oral condition mentioned composites were stored in water for specific times and temperatures. In the next step in order to investigate the bonding changes, FTIR test was used. The micro hardness test showed that the maximum hardness value about 350-450 VHN. based on FTIR and micro hardness results, the non polar system showed more suitable properties; more mechanical analysis including Diametral Tensile Strength (DTS) and flexural strength tests were employed. The results of flexural test showed the value around 80-90 MPa.

Keyword: dental resin composite, coupling agent, apatite glass ceramic, mechanical property, hydrolysis resistance