

عنوان مقاله:

Effect of P₂O₅ on Crystallization Behavior and Chemical Resistance of Dental Glasses in the Li₂O-SiO₂-ZrO₂ System

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خلاصه مقاله:

Commercial dental lithium disilicate based glass-ceramics containing various amounts of P₂O₅ were synthesized. Regarding the crystallization behavior and physico-chemical properties of the glasses, the optimum percent of P₂O₅ was determined as 8 %wt. Crystallization behavior of the glasses was investigated by X-ray diffraction (XRD) and differential thermal analysis (DTA). The micro-hardness and chemical resistance of both glass and glass-ceramic series were also determined. According to our results, lithium phosphate was precipitated prior to crystallization of the main phases, i.e. lithium meta silicate and lithium disilicate. This early precipitation led to evacuation of residual glass phase from lithium ions, which caused increasing the viscosity of glass and so shifting of crystallization to higher temperatures. In addition, increasing in P₂O₅ amounts and consequently increasing in Li₃PO₄, led to significant decrease in the crystallite size and aspect ratio of crystals. Furthermore, while the chemical resistance of the glasses was decreased with P₂O₅, it was increased with P₂O₅ after heat treatment process. The chemical solubility of these three glass-ceramics was between 2080~1188 μg/cm².

کلمات کلیدی:

Glass-ceramic, Lithium-disilicate, Nucleation agent, P₂O₅, morphology, Chemical solubility

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