

Obtaining of Thermal Diffusivity of Human Enamel and Dentin

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According to the Rosencwaig and Gersho theory for the photoacoustic effect (PA) in solids, the thermal diffusivity of human enamel and dentin was determined. The Rosencwaig and Gersho model describes the PA effect in a sample inside a hermetically sealed cell (photoacoustic chamber), in which the incident modulated radiation absorbed by the sample generates thermal waves. These waves in turn generate pressure variations in the gas content in the chamber, which can be detected by a microphone and transformed into an electrical signal which is amplified and stored for later analysis. The results indicate that the crystallinity and porosity in the enamel and dentin are important factors influencing the heat diffusion through the different structures of dental enamel and dentin.