

0944 Curing Efficiency of a Direct Composite at Different Temperatures

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Objective: Visible light activated tooth colored materials have become increasingly popular with most dental patients today. Therefore it is essential that the dentist be aware of the factors which may effect the materials performance. The purpose of this study was to evaluate one such factor, temperature of the material being activated, which may influence the degree of conversion.

Methods: Using a Mettler Differential Scanning Calorimeter (Mettler Corp., Highstown, NJ), sample disks (10mm diameter x 1.8mm thick) of XRV (Kerr Corp., Orange, CA) were held at a constant temperature of 5°C, 25°C, 37°C, and 70°C and cured with a Demetron visible light (Demetron Corp., Danbury, CT) for 40 seconds with a mylar strip separating the light from the composite. Three samples were evaluated at each temperature. The samples were then post cured in the DSC from 25°C to 200°C at 20°C per minute. The enthalpy associated with the post cure was measured. The enthalpy for 100% conversion was determined by thermally polymerizing a sample of composite catalyzed with 0.1 weight percent of Benzoyl Peroxide in the DSC. The degree of conversion was determined by 1-enthalpy of post cure/enthalpy of 100% cure X 100.

Results:

Temperature	5°C	25°C	37°C	70°C
% Conversion	86.78 (.04)	90.86 (.28)	93.85 (0.0)	97.74 (.31)

Results showed a significant difference in conversion at each temperature when analyzed using ANOVA and Tukey's Test ($p < 0.01$).

Conclusion: Temperature has a significant effect upon the immediate conversion obtained for a light cured composite.

[Seq #124 - Materials Structure/Properties/Conversion/Biocompatibility](#)

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