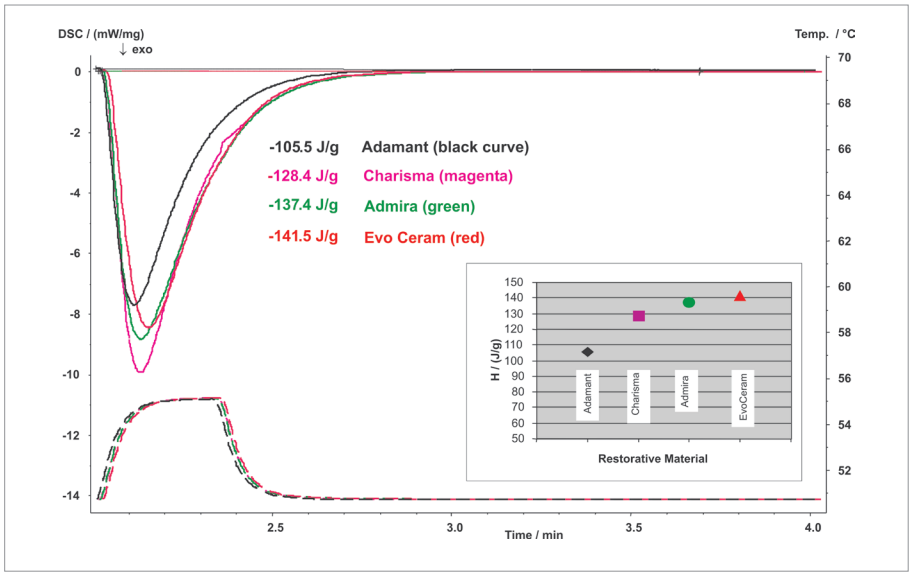
APPLICATION**SHEET**

Polymers – Pharmaceuticals – Photo DSC 204 ***F1*** *Phoenix®*

Methacrylates Used as Dental Restorative Material

Introduction

In dental applications, light-curing dental composites are used as restoratives (fillings) or veneering materials. The materials are generally based on methacrylate systems such as bis-glycoldimethacrylate (bis-GMA) or urethandimethacrylate (UDMA). Additional monomers are used as diluents or to guarantee the cross-linking abilities of the resin. Additionally, inorganic fillers up to 80 weight% are used to improve the mechanical properties and reduce polymerization shrinkage. The examples for dental restorative composites measured here are Charisma (Heraeus Kulzer), Adamant and EvoCeram (Icovlar-Vicadent) and Admiro (Voco).



Test Conditions

Temperature range:	51°C isothermal
Heating/cooling rates:	0 K/min
Atmosphere:	Nitrogen (50 ml/min)
Sample mass:	approx. 25.5 mg
Crucible:	open Al
UV device:	Delolux 04
Radiation time:	60 s

Test Results

All materials showed a strong exothermic reaction after the UV light is activated. After the initial curing process, the UV system was switched on a second time. From the difference signal between the first and second illumination process, the reaction enthalpy was calculated as area below the peak. As a result of the different composition and filler content, different reaction enthalpies were found for the different restorative materials (EvoCeram 141.6 J/g, Charisma 128.4 J/g and Adamant 105.5 J/g).

NGB · Application Sheet 107 · E · 2006 · Technical specifications are subject to change.

NETZSCH-Gerätebau GmbH
Wittelsbacherstraße 42 · 95100 Selb · Germany
Phone: +49 9287/881-0 · Fax: +49 9287/881505
at@netzsch.com · www.netzsch.com