

Introduction

Compomers are often used in the primary dentition and the introduction of colored compomers may contribute to the motivation of children to the dental treatment.

Objetives

The aims of this study were to compare the Knoop microhardness and the depth of cure of a tooth colored compomer material and a new colored compomer material.

Materials and Methods

Materials tested were Twinky Star (TS-VOCO) (Colors: blue, berry, green, silver, gold, lemon, orange and pink) and Dyract Extra (DE- Dentsply International) (Colors: A2 and A3) (Fig.1).



Figure 1 – Materials tested (TS & DE)

Samples (n=10) were made in a jig (5mm deep) (Fig.2&3), light cured as per manufacturer's instructions, with a (3M Curing Light XL3000, 550mw/cm²), (Fig.4) and stored for 24hrs in the dark (37°C at 100% humidity) before testing. During light curing, the lateral surface of each sample was protected from oxygen inhibition with a plastic band.

Knoop microhardness (KH- Duramin-Struers, Westlake, USA) evaluation was performed at the lateral side of each specimen at 0.5, 1.5, 2.5 and 3.5mm from the irradiated surface (Fig.5). No measurements were made at the top due to the oxygen inhibition.



Figure 2 & 3– Sample's production in a Jig, 5mm deep

Figure 4– Curing the materials as per manufacturer's instructions

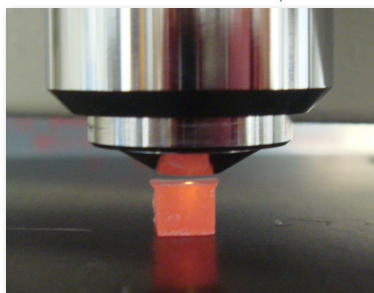


Figure 5 – Knoop microhardness (KH- Duramin-Struers, Westlake, USA)

Depth of cure was determined by microhardness ratio (HR) between 0.5mm KH values and the KH measurements performed at other depths. HR higher than 80% was considered a satisfactory degree of conversion of the deeper surfaces.

KH data achieved at 0.5mm were submitted to one-way ANOVA, followed by Student-Newman-Keuls post-hoc test using appropriate software (SPSS, V17.0, SPSS Inc., Chicago, IL 60606, USA) to compare surface values.

Results

Microhardness mean values ranged from 7.85 KH (DE A3, 3.5mm) and 62.34 KH (TS Blue, 0.5mm) (Fig.6).

HR ranged between 92% (TS Lemon, 1.5mm) and 22% (DE A2, 3.5mm) (Fig. 7). TS Silver yielded ratios higher than 80% in all depths. Lemon and Orange colored TS achieved HR above 80%, at 1.5mm of depth.

A ratio inferior to 80% was obtained in all other measurements.

Comparing KH values obtained at 0.5mm, TS Berry showed significantly ($p<0.05$) higher microhardness values than DE A2 and A3, and TS Blue yielded significantly ($p<0.05$) higher microhardness than DE A3 (Fig. 8).

No other significant differences were found ($p\geq 0.05$).

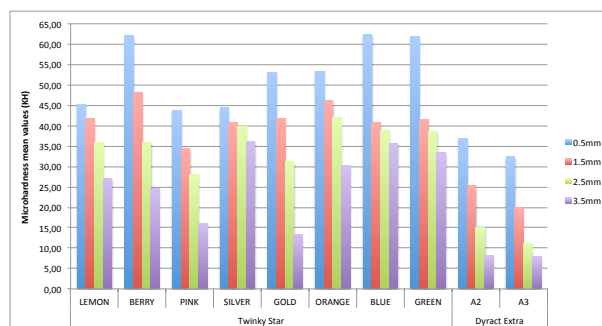


Figure 6– Microhardness mean values (st dev) of TS and DE (measurements at 0.5mm, 1.5 mm, 2.5 mm and 3.5 mm from the top)

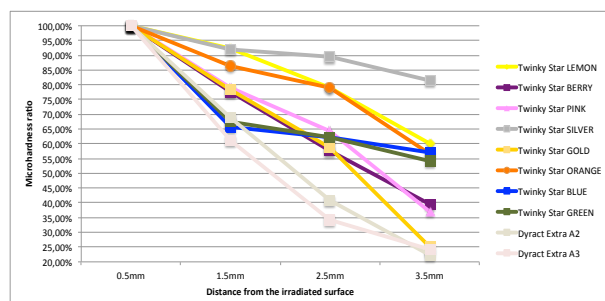


Figure 7 – Microhardness ratio

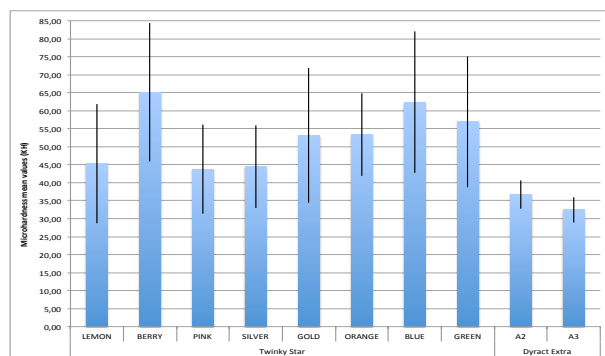


Figure 8– Microhardness mean values (st dev) of TS and DE (measurements at 0.5 mm from the top)

Conclusions

- TS Silver yielded a ratio higher than 80% in every depth including 3.5mm depth.
 - Both DE groups yielded ratios lower than 80% in all depths.
- TS Berry yielded significantly higher microhardness values at 0.5mm depth than the DE groups (A2 and A3).
- TS Blue yielded significantly higher microhardness values at 0.5mm depth than the DE A3 group

Authors wish to thank the manufacturer for the material support