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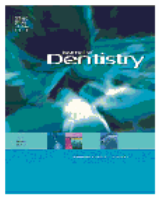

Monitoring dental erosion by colour measurement: An *in vitro* study

J.B. Krikken, J.R. Zijp, M.C.D.N.J.M. Huysmans *

Department of Dentistry & Dental Hygiene, Academic Center for Oral Health, University Medical Center Groningen, University of Groningen, P.O. Box 196, 9700 AD Groningen, The Netherlands

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ABSTRACT

Objectives: The aim of this study was to develop a method to monitor dental erosion by evaluation of the colour change of teeth as a function of enamel loss, and to evaluate the reproducibility of the method used.

Methods: Light reflectance spectra of 12 extracted human incisors were measured using a spectroradiometer and diffuse illumination. From these spectra CIELab colour parameters L^*, a^* and b^* were calculated. Erosive dental wear was simulated by incrementally removing enamel layers. We monitored the change of the colour parameters as a function of the enamel thickness removed.

A clinical situation using a phantom head and ambient illumination was simulated with 8 incisors. In this set-up colour change due to polishing was evaluated. The teeth were immersed in coffee and tea to estimate the effects of nutritional dyes, and so, to determine reproducibility of the method used in clinical situations.

Results: A relationship between tooth colour measured and enamel loss was found, in particular for the b^* value. The relation between the b^*-value and the enamel thickness removed showed a slope of $15 \pm 3\ \mathrm{mm}^{-1}$, if the remaining enamel layer had a thickness of less than 0.5 mm.

Polishing of the teeth made them less yellow. Immersion in coffee darkened the teeth, but immersion in tea had no significant effect.

Conclusions: Due to individual variation, it was impossible to use this relationship to estimate the remaining enamel thickness, but the method presented may be suitable for monitoring progression of erosive enamel loss.

* *Corresponding author*. Tel.: +31 50 363 2995; fax: +31 50 363 2696.
E-mail address: m.c.d.n.j.m.huysmans@med.umcg.nl (M.C.D.N.J.M. Huysmans).
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