Change in Color of Reinforced Glass Ionomers for Restorative Filling

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Abstract: This study examined the change in color of reinforced glass ionomers for restorative filling. Disc specimens (10 mm dia., 1 mm thick) were fabricated from a hand-mixed-type reinforced glass ionomer for restorative filling (Fuji IX GP, GC: A) and two mechanical-mixed-type reinforced glass ionomers for restorative filling (Fuji IX GP Fast Capsule, GC: B; Fuji IX GP Extra, GC: C). The specimens were immersed in deionized water (37±1℃) one hour after the start of mixing (baseline) up to 336 hours. The color differences (ΔE^*ab, n=6) between the baseline and 24, 168 or 336 hours after the start of immersion and the Translucency Parameter values (TP value) were determined using a spectrocolorimeter. The specimens were also weighed after water immersion. The results were statistically compared using ANOVA/Scheffé's test. The TP values of the cements at 24, 168 and 336 hours of immersion were significantly higher than the baseline values ($p<0.05$). There were no significant differences in the TP values of cements B and C after 24 hours ($p>0.05$). The ΔE^*ab values and the weights of the cement A and B specimens after 168 and 336 hours were significantly greater than for the specimens immersed for 24 hours ($p<0.05$). An increase in the TP values of the cement specimens could be attributed to the progress of the setting reaction during the first 24 hours after the start of mixing. The mechanical-mixed-type cement C exhibited superior color stability compared to the other cements tested. This finding may be due to the fact that cement C has improved chemical composition and powder particles, and reaches stable water sorption soon after mixing.

Key words: Reinforced glass ionomer cement, Color, Translucency parameter value