

CHAPTER 3

RESULTS

Table 3 shows means, standard deviations and range of calcium concentration after demineralization for 8 hours. In all groups calcium had been released from the enamel. The difference between the groups was statistically significant (Kruskal-Wallis test, $P < 0.005$). From the specimens in group A most calcium was released whilst least calcium was released from the group C specimens. The fluoride concentration in solution had a strong effect on the calcium release, as the 10 mg/L fluoride decreased the calcium concentration from 46.9 in group A to 33.7 mg/L in group B ($P < 0.005$).

The high number of fluoride varnish application had moderate, but significant effect on the enamel. The amount of calcium released from the specimens given intensive applications was 28.4 mg/L whereas it was 33.7 mg/L among those given a single fluoride varnish application only ($P < 0.05$).

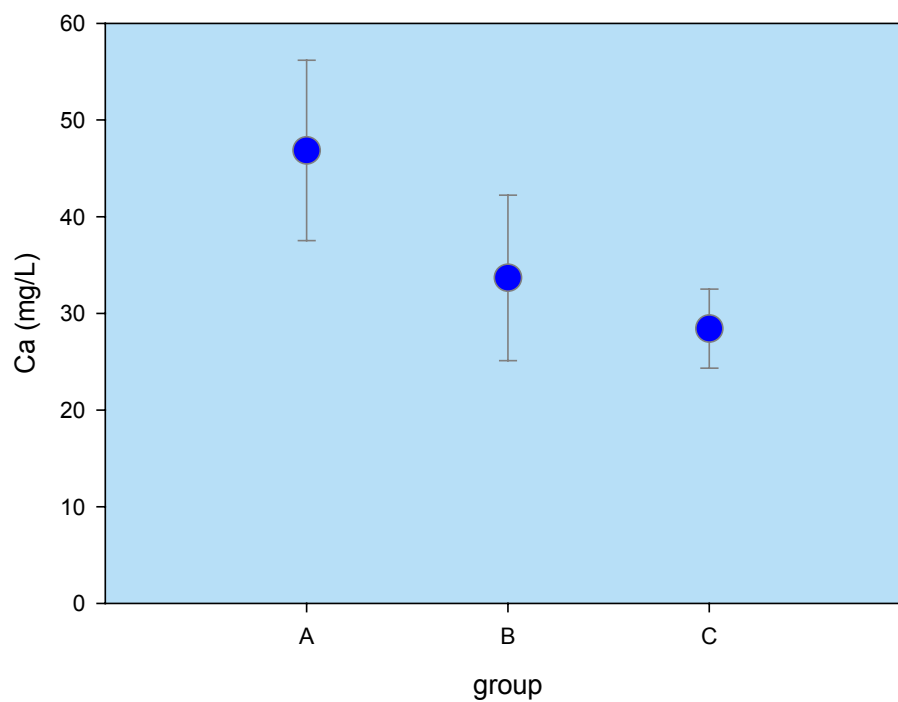
Table 3. Means, standard deviations and range of dissolved calcium concentration.

Group	N	Calcium concentration (mg/L)			P value
		Minimum	Maximum	Mean \pm SD	
A	15	33.00	61.71	46.85 \pm 9.33	P<0.005
B	15	20.30	49.90	33.67 \pm 8.56	
C	15	22.00	36.50	28.42 \pm 4.09	P<0.05

Group A – Single fluoride varnish application group immersed in 0.05 mol/L acetic acid with 1 mg/L fluoride.

Group B - Single fluoride varnish application group immersed in 0.05 mol/L acetic acid with 10 mg/L fluoride.

Group C - Intensive fluoride varnish application group immersed in 0.05 mol/L acetic acid with 10 mg/L fluoride.



Group A – Single fluoride varnish application group demineralised in 0.05 mol/L acetic acid with 1 mg/L fluoride.

Group B - Single fluoride varnish application group demineralised in 0.05 mol/L acetic acid with 10 mg/L fluoride.

Group C - Intensive fluoride varnish application group demineralised in 0.05 mol/L acetic acid with 10 mg/L fluoride.

Figure 9. The amount of calcium dissolved (mg/L) from enamel in group A, B and C.

Figure 10 shows the SEM study of control enamel surface at high magnification of 7000. Before treatments the enamel surfaces were almost identical. They were smooth, without porosity, but with minor superficial scratches. At marginal areas between dissolved and non dissolved areas, the scanning electron micrograph show distinct signs of enamel dissolution. The different depths of demineralisation in the three study groups appear in Figure 11. When the fluoride concentration in the demineralising solution was 10 mg/L, the lesion appeared less deep whilst the depth of the dissolved areas of the specimens in group B and C was almost equal.

Within the dissolution areas at low magnification of 500 (Figure 12), the enamel surfaces of all groups showed diffuse irregular destruction and erosion of rod enamel. The appearance of the porous surfaces indicates that the end of the enamel rods had been partly dissolved by the acid as well as the interrod areas exposing the rod structure of enamel. We could observe a massive destruction of the exposed areas among the specimens in group A. In groups B and C the dissolution had been less intensive with a less pronounced prism pattern (Figure 12A, B, C).

Figure 13 shows the exposed enamel surfaces at high magnification, x 7000. It can be observed that the crystals in protruding interrod areas are arranged in irregular directions. The ends of the enamel rods have been dissolved leaving rod shaped deep areas surrounded by the interrod enamel. At high magnification the difference of the effects of the treatments is not quite obvious. The eroded rod in group A were larger in size than group B and C. The size of eroded rod in group C were slightly less than group B.

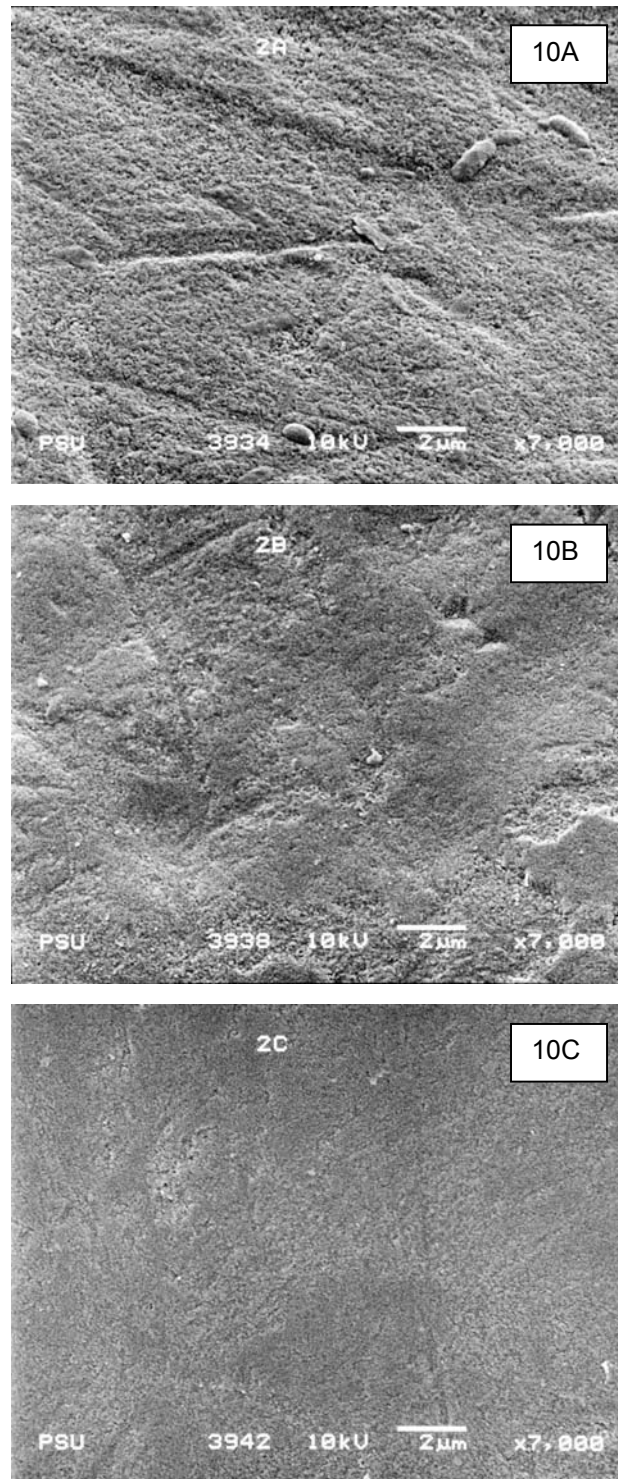


Figure 10. SEM photographs of non-exposed areas from the three groups A,B,C at high magnification, x 7000

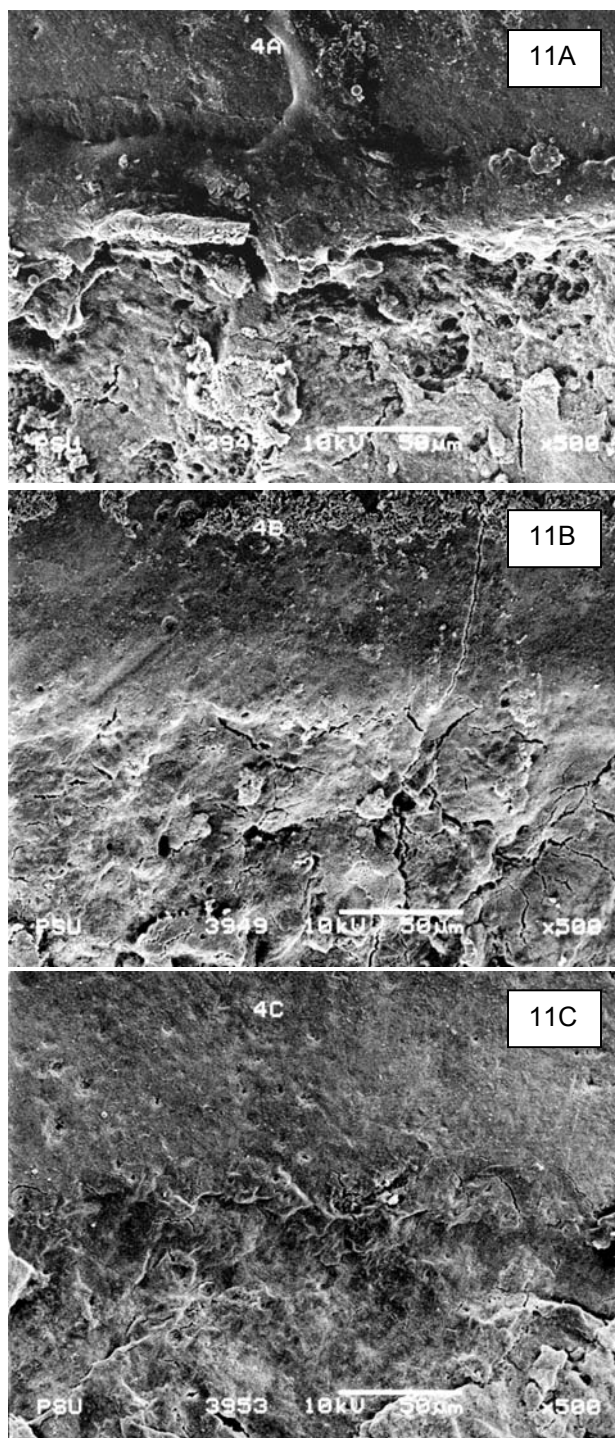


Figure 11. SEM photographs of marginal areas at low magnification, x 500. 11A is a specimen given a single fluoride varnish application and demineralised in acid with 1 mg/L fluoride, 11B received a single fluoride varnish application and was demineralised in acid with 10 mg/L fluoride whilst 11C has been given intensive fluoride varnish applications.

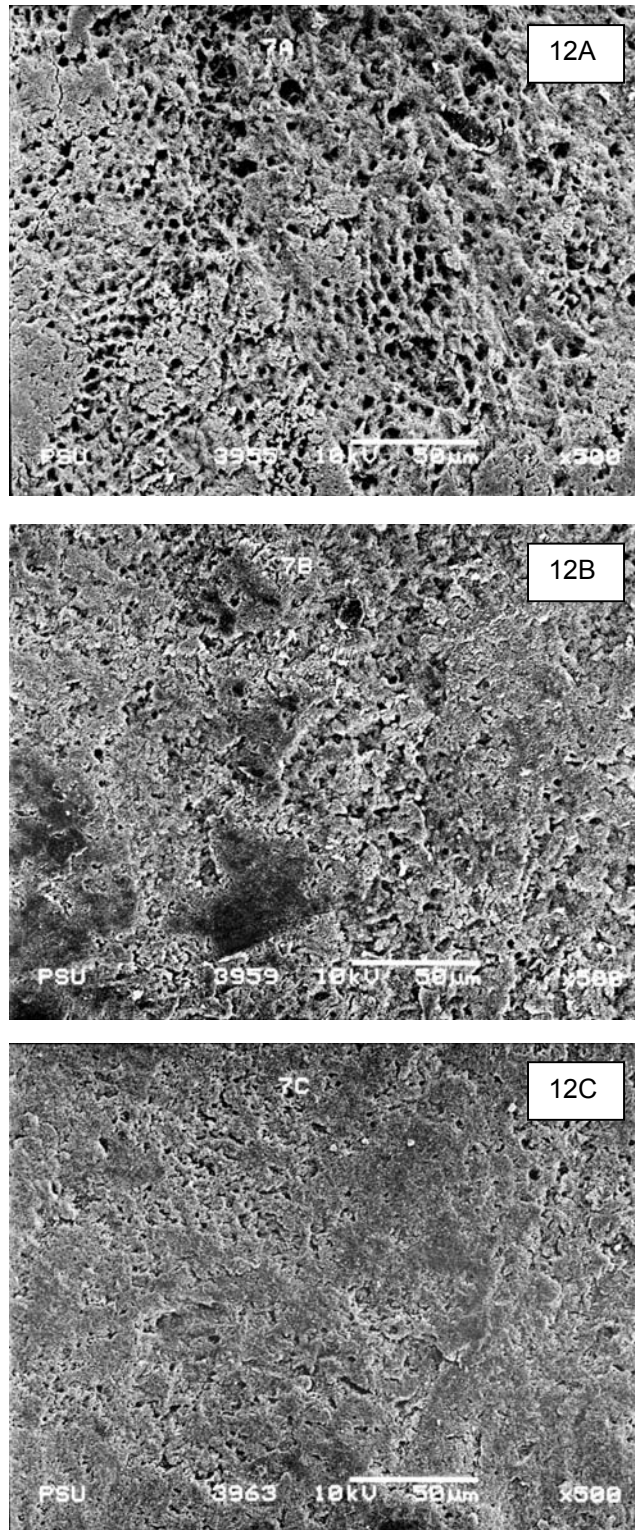


Figure 12. SEM photographs of exposed areas at low magnification, x 500. For treatment of the specimens, see Figure 11.

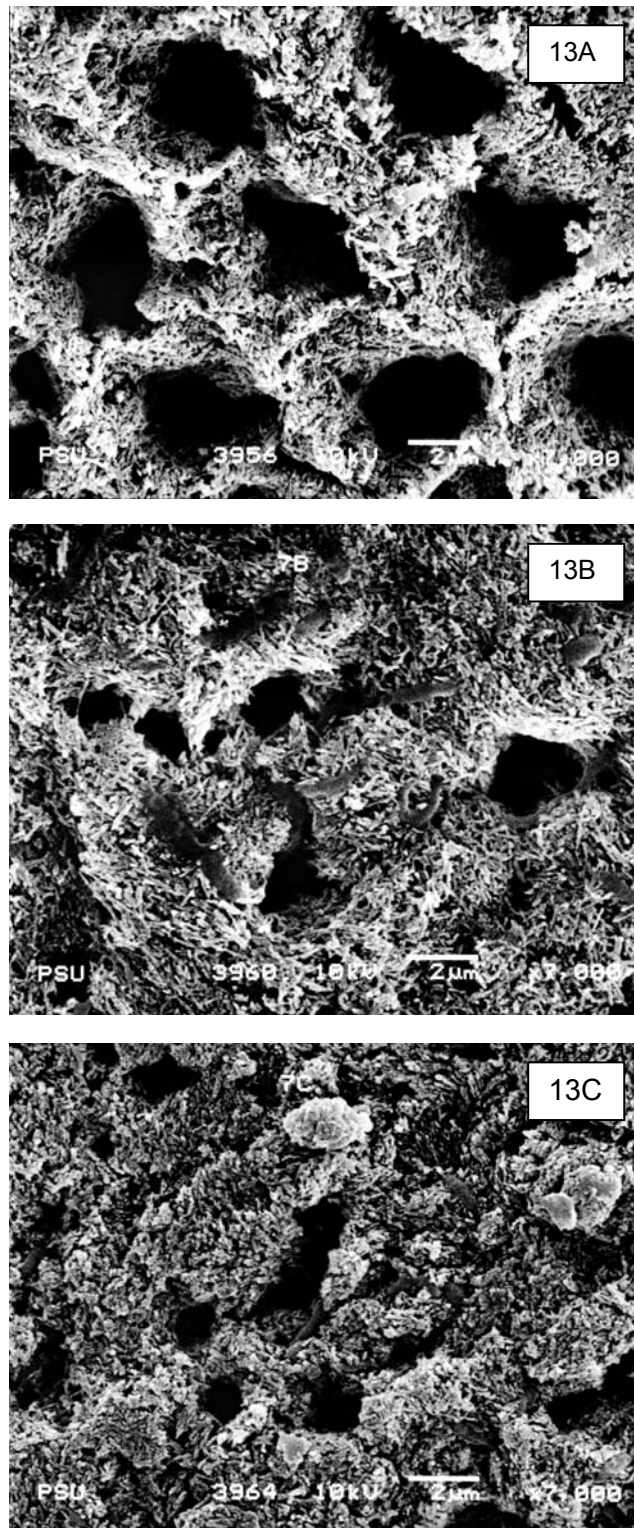


Figure 13. SEM photographs of exposed areas at high magnification, x 7000. For treatment of the specimens, see Figure 11.