

**The Influence
Of Dietary Simulating Solvents
On a Recent Composite
Topography**

((In vitro study))

**A thesis
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Abstract

Composite restoratives are not stable after polymerization and constantly interact with their environment.

There are fluids advocated to simulate the chemical action of foodstuffs by the Division of Food and Drug Administration, Department of Health USA.

The purpose of the present *in vitro* study was to assess the influence of dietary simulating liquids on the microhardness, surface roughness, and color stability of polished and non polished organically modified ceramic, at different storage time 1, 7, 14 days.

The food simulating liquids are 10% Ethanol-water, 50% Ethanol water and corn oil with the control, D.D.W.

A total 240 samples were prepared and then stored in a dark phial containing D.W. at 37 °C for 7 days before conditioning. Then divided into 3 groups, 80 samples in each, and stored in the conditioning liquids at 40 °C for 1,7,and14 days .

At the end of each conditioning time the specimens were subjected to color comparison test, surface roughness test, and microhardness (Vickers hardness number :VHN) test.

The statistical analysis of the results using one-way ANOVA test, student t-test, and LSD test at a significant level of $\alpha=0.05$), revealed that increase aging time will increase the VHN value and decrease the Ra value specially for the control group aged in D.W. Aging in FSL's produced an increase in VHN value, but to a degree less than that of D.W. which in turn produced significant effect of these liquids on ORMOCER hardness with time in comparison to the control group.

Most effect will be seen with 50% Ethanol on VHN and color stability. The effect of FSL's on ORMOCER VHN were on long term duration (14 days) while for color change (7 days) is the critical time and after the first week no additional color will take place.

Surface roughness of polished and non- polished ORMOCER was not affected by any FSL's and at any aging time.

Polishing of the composite will increase the VHN value and Ra value for all FSL's and for all time intervals.

The environmental solvent in the oral cavity lies somewhere between the water and ethanol. So it can safely be assumed that the exposure time of ORMOCER restoratives to this environment is negligible. As clinically these different findings might be insignificant because the upper and lower limits of the values obtained for all properties in all FSL's and at each storage time, were within the range for clinically acceptable composite resins.