



Journal of Prosthodontics Dentistry
An Official Publication of Bureau for Health & Education Status Upliftment
 (Constitutionally Entitled As Health-Education, Bureau)

Effect of pH on Surface Roughness and Hardness of Denture Base Resins: an in Vitro Study

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Abstract:

Surface roughness and hardness are important physical properties of denture base acrylic resins. Dentures are often exposed to different pH due to intake of food, gastro esophageal regurgitation and use of denture cleansers. The objective of the study was to evaluate the effect of pH on the surface roughness and hardness of two denture base resins.

One hundred and forty samples of conventional and high impact denture base resins were used in this study. Each group of samples were immersed in solutions of pH 4, 7 and 10 for duration of 15 and 60 minutes. Ten samples of each denture base resin was immersed in distilled water and was used as control. Surface roughness and hardness were measured.

The results showed that, for pH 4 and pH 7 the mean surface roughness of high impact denture base resin was significantly higher than that of conventional denture base resin ($p < 0.001$), while for pH 10 the mean surface roughness of conventional denture base resin was significantly higher than that of high impact denture base resin ($p < 0.001$). For all immersion medium the mean surface hardness of conventional denture base resin was significantly higher than that of high impact denture base resin ($p < 0.001$). It was concluded that both the denture base resins exhibited significant changes in surface roughness and hardness after immersion in solutions of different pH and immersion period.

Keywords: Denture base resins, high impact denture base resins, surface roughness, hardness, pH

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| Website: http://heb-nic.in/jopd | |
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