Abstract

A new generation of composites called nanofill composite resin exhibits great both mechanical and optical properties. One of most popular beverages consumed worldwide are carbonated drinks, which contain a low pH level as well as a high level of sugar. This study aimed to determine whether various carbonated drink pH levels impacted the flexural strength of nanofilled composite resin.

The research's materials featured composite resin (Filtek Z350XT, USA), Indonesia carbonated drinks which were Fanta Orange and Coca Cola. The samples were prepared using a metal mold (25mm x 2mm x 2mm). A total of 18 samples were prepared and immersed in 3 groups with different pH level for 15 days, namely distilled water with pH 7.0; Fanta Orange with pH 3.1; and Coca Cola with pH 2.7. Samples were then tested for flexural strength using the Universal Testing Machine with a span between supports of 20mm. After obtaining the results, the data was analyzed using the One-way ANOVA method.

The results showed that the average flexural strength value of nanofill composite resin immersed in distilled water was 95.84±19.97 MPa, Fanta Orange was 61.65±14.86 MPa, and Coca Cola was 56.27±20.72 MPa. The results of One-Way ANOVA statistical test showed that there were significant different p: 0,005 ($p < 0,05$) on the flexural strength. This study concluded that variation of pH in carbonated drinks has cause the flexural strength of nanofill composite resin to decrease.

Keywords: Nanofill composite resin, Carbonated Drinks, Flexural Strength, pH value

INTISARI

Generasi baru komposit yang disebut resin komposit nanofill menunjukkan sifat mekanik dan optik yang hebat. Salah satu minuman yang paling populer dikonsumsi di seluruh dunia adalah minuman berkarbonasi, yang mengandung tingkat pH rendah serta tingkat gula yang tinggi. Penelitian ini bertujuan untuk mengetahui apakah berbagai tingkat pH minuman berkarbonasi berpengaruh terhadap kekuatan fleksural resin komposit nanofill.

Bahan penelitian berupa resin komposit (Filtek Z350XT, USA), minuman berkarbonasi Indonesia yaitu Fanta Orange dan Coca Cola. Sampel disiapkan menggunakan cetakan logam (25mm x 2mm x 2mm). Sebanyak 18 sampel disiapkan dan direndam dalam 3 kelompok dengan kadar pH yang berbeda selama 15 hari, yaitu akuades dengan pH 7,0; Fanta Orange dengan pH 3,1; dan Coca Cola dengan pH 2,7. Sampel kemudian diuji kuat fleksural menggunakan Universal Testing Machine dengan bentang antar tumpuan 20 mm. Setelah mendapatkan hasil, data dianalisis menggunakan metode One-way ANAVA.

Hasil penelitian menunjukkan nilai kuat fleksural rata-rata resin komposit nanofill yang direndam dalam aquades adalah 95.84±19.97 MPa, Fanta Orange 61.65±14.86 MPa, Coca Cola 56.27±20.72 MPa. Hasil uji statistik One-Way ANOVA menunjukkan bahwa terdapat perbedaan yang signifikan p:0,005 ($p< 0,05$) terhadap kuat lentur. Penelitian ini menyimpulkan bahwa variasi pH pada minuman berkarbonasi menyebabkan kekuatan fleksural resin komposit nanofill menurun.

Kata kunci: Resin komposit nanofill, Minuman berkarbonasi, Kuat Fleksural, Nilai pH