

"Effect of Different Pink Coloring Liquids on Mechanical and Optical Properties of 3Y Zirconia"

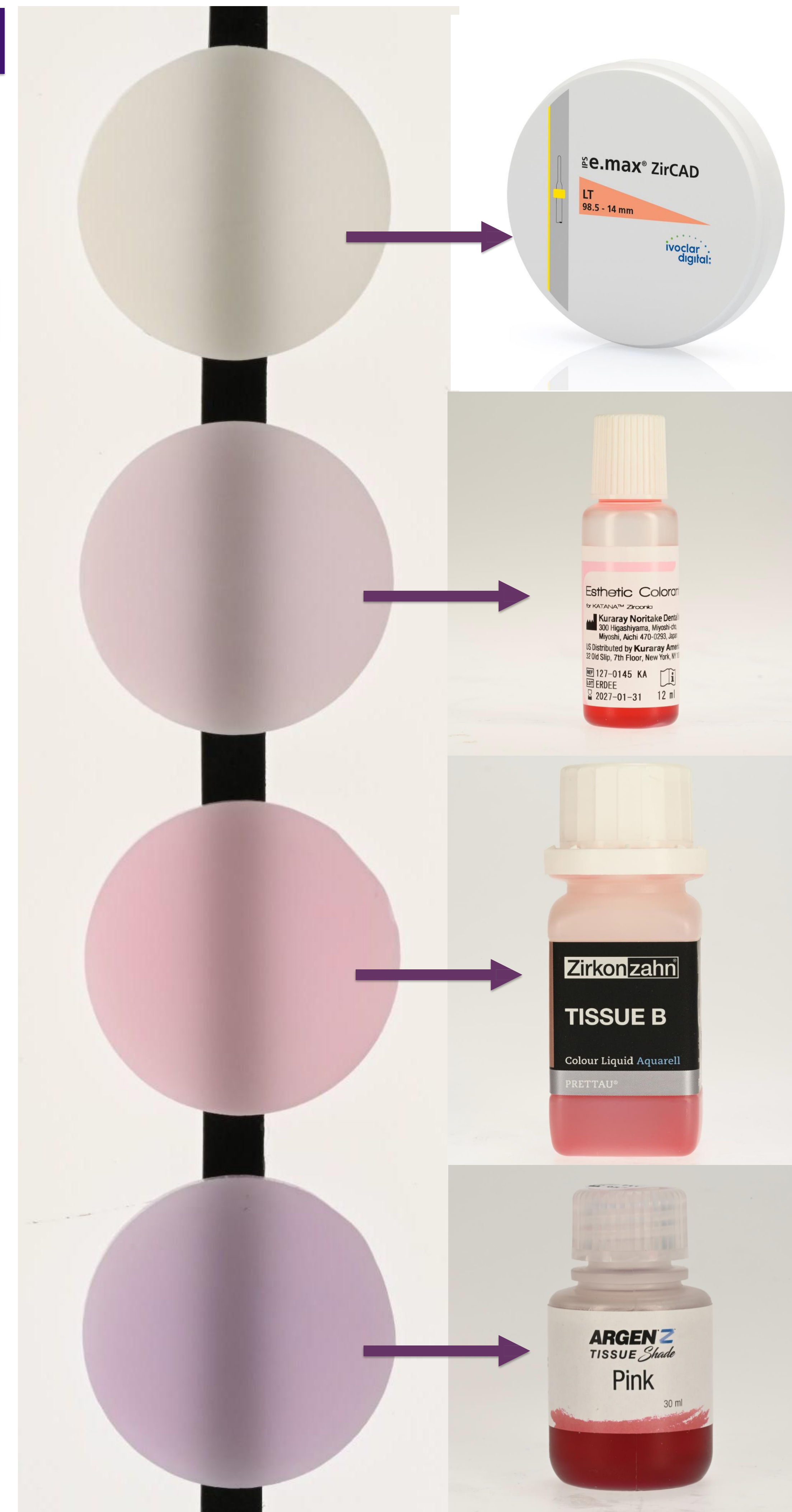


Purpose

To evaluate the effect of pink coloring liquid on the mechanical and optical properties of the 3mol% yttria stabilized zirconia (3Y).

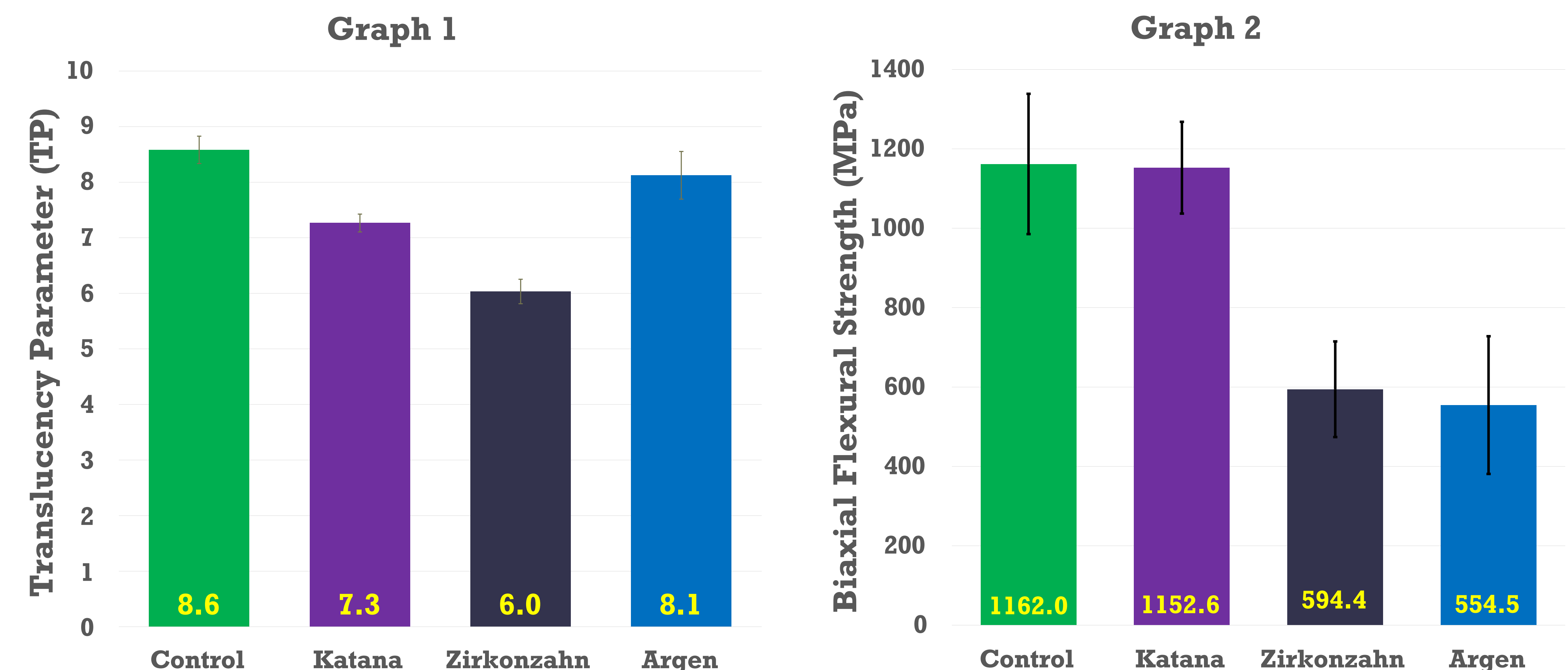
Materials and Methods

1 mm and 2 mm discs were fabricated from 3Y zirconia (IPS E.max ZirCAD LT). Pre-sintered discs were randomly allocated into four groups (n=10 per group) including control group with no coat of pink coloring liquid and study groups including Katana Pink Esthetic Colorant, Zirkonzahn Prettau® Aquarell Tissue B, and ArgenZ Tissue Shade liquid. After applying the liquid, discs were let to dry and then sintered according to the manufacturer's recommendation. Translucency parameter (TP) of the 1 mm thick discs was evaluated by measuring L*a*b* values against a black and a white background with a spectrophotometer. Then biaxial flexural strength of 1 mm thick specimens was measured according to ISO 6872. Surface hardness and as-sintered surface roughness was measured on 2 mm discs using Vicker's hardness test and profilometer, respectively. One-way analysis of variance (ANOVA) was used for the statistical analyses with the significance level set at 5% ($\alpha = 0.05$).



RESULTS

Pink coloring liquid was found to affect the TP, biaxial flexural strength, and as-sintered surface roughness, significantly ($p < 0.001$). According to post-hoc test, TP pink coloring liquid resulted in significant reduction in TP with the highest decrease caused by Zirkonzahn followed by Katana and Argen, respectively (Graph 1). Biaxial flexural strength (Graph 2) were significantly reduced with Zirkonzahn and Argen coloring liquids ($p < 0.001$). However, Katana coloring liquid did not affect TP of samples when compared to control group ($P > 0.05$). Only Argen resulted in significant reduction in HV and as-sintered surface roughness ($p < 0.01$). Other coloring liquid did not alter the HV or as-sintered surface roughness ($p > 0.05$).



CONCLUSION

Pink coloring liquids affected the mechanical and optical properties of 3Y zirconia and this effect was dependent on the brand of the coloring liquid used. It is recommended to select the pink coloring liquid carefully to avoid potential adverse effect on the 3Y zirconia.