

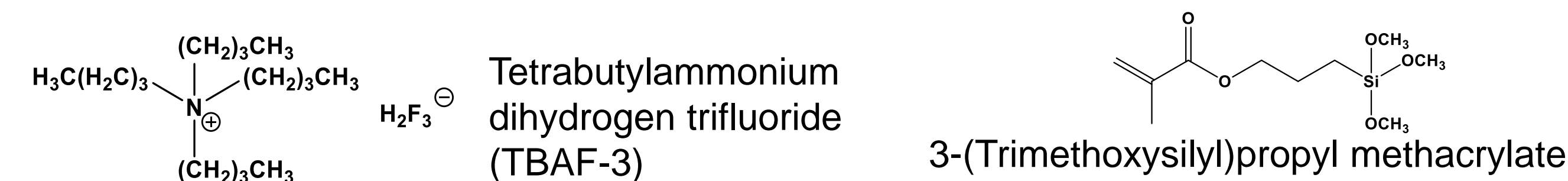
INTRODUCTION

The lithium disilicate glass ceramic restorations are increasingly used in restorative dentistry due to growing demand of minimally invasive, biocompatible and tooth colored restorations. It has been reported that the clinical success of these ceramic restorations can be directly related to their ability to achieve chemical bonding with luting cements.

Hydrofluoric acid (HF) etching of the ceramic materials and application of the silane coupling agent prior to cementation with resin cements are critical steps to achieve predictable chemical bond. The HF acid reacts with the glass matrix, selectively removing it and exposing the crystalline structure. As a result, the surface of ceramic becomes rough, which is expected for micromechanical retention on the ceramic surface and improves bonding. However, the high acidic characteristic of HF and its potential to affect soft and hard tissues is always considered as a biohazard concern. Therefore, other efficient alternatives have been investigated by dental manufacturers.

Recently, a self-etching primer (Monobond[®] Etch and Prime; Ivoclar Vivadent, Inc.) has been introduced in the market. It contains ammonium polyfluoride for etching glass ceramic and trimethoxypropyl methacrylate for silanization in one single step, and thus eliminating the use of HF.

Monobond Etch & Prime: Key Components:



OBJECTIVE

The objective of the study was to measure the effect of different surface treatments on the biaxial flexural strength of lithium disilicate.

NULL HYPOTHESIS

No significant difference in the biaxial flexural strength of lithium disilicate will be observed after different surface treatments.

MATERIALS AND METHODS

Materials:

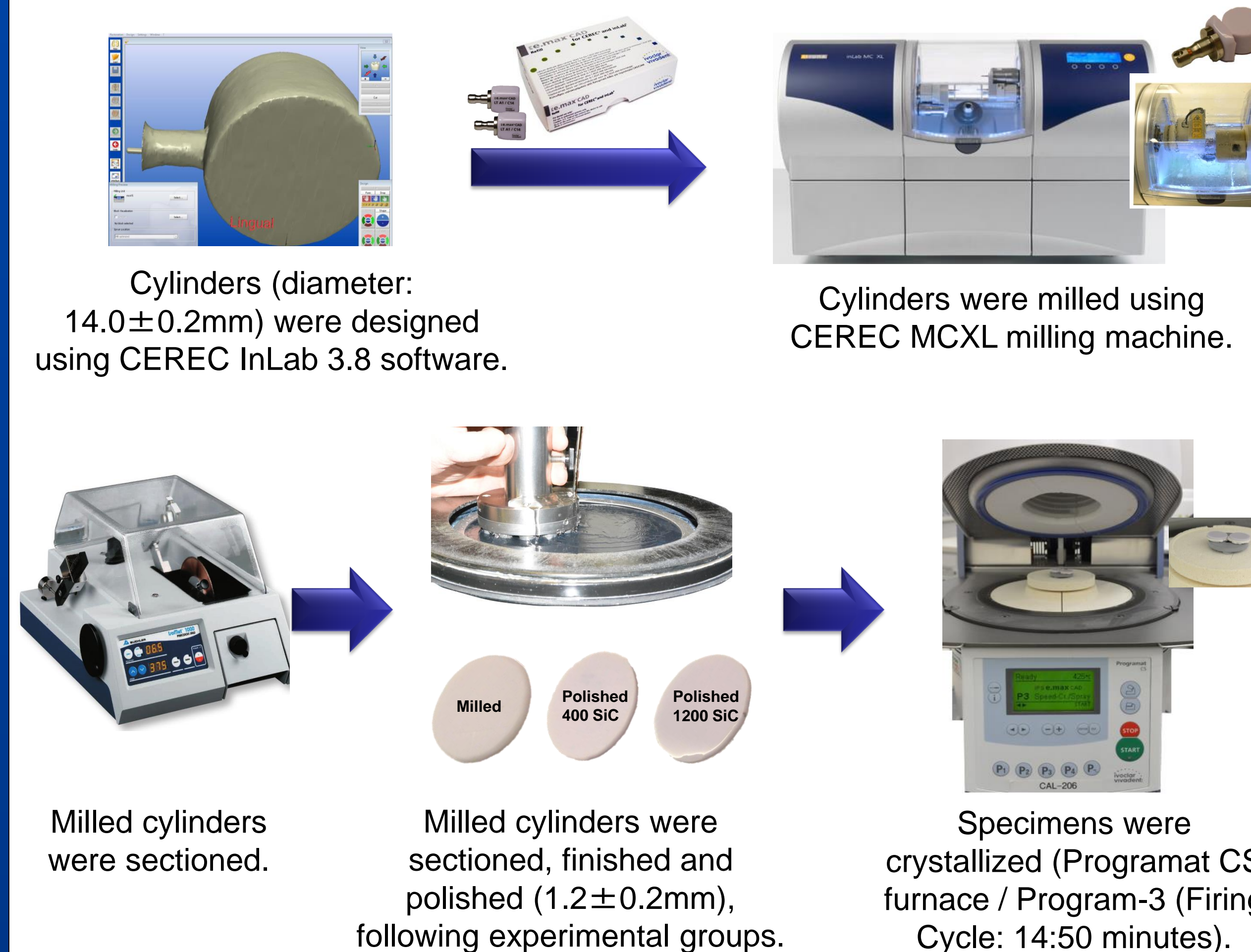


MATERIALS AND METHODS, Cont.

Groups	Surface Preparation	Surface Treatment	
1	Milled + Crystallized (NO TREATMENT)	Monobond [®] Plus	
2	1200 SiC Paper + Crystallized (POLISHED)		
3	320/400 SiC paper + Crystallized		Al ₂ O ₃ (50µm)/2bar/Distance-10mm) (MICRO-ETCHED)
4			HF (4.5%/20s) (ACID ETCHED)
5			Monobond [®] Etch & Prime (Self-Etch Primer)

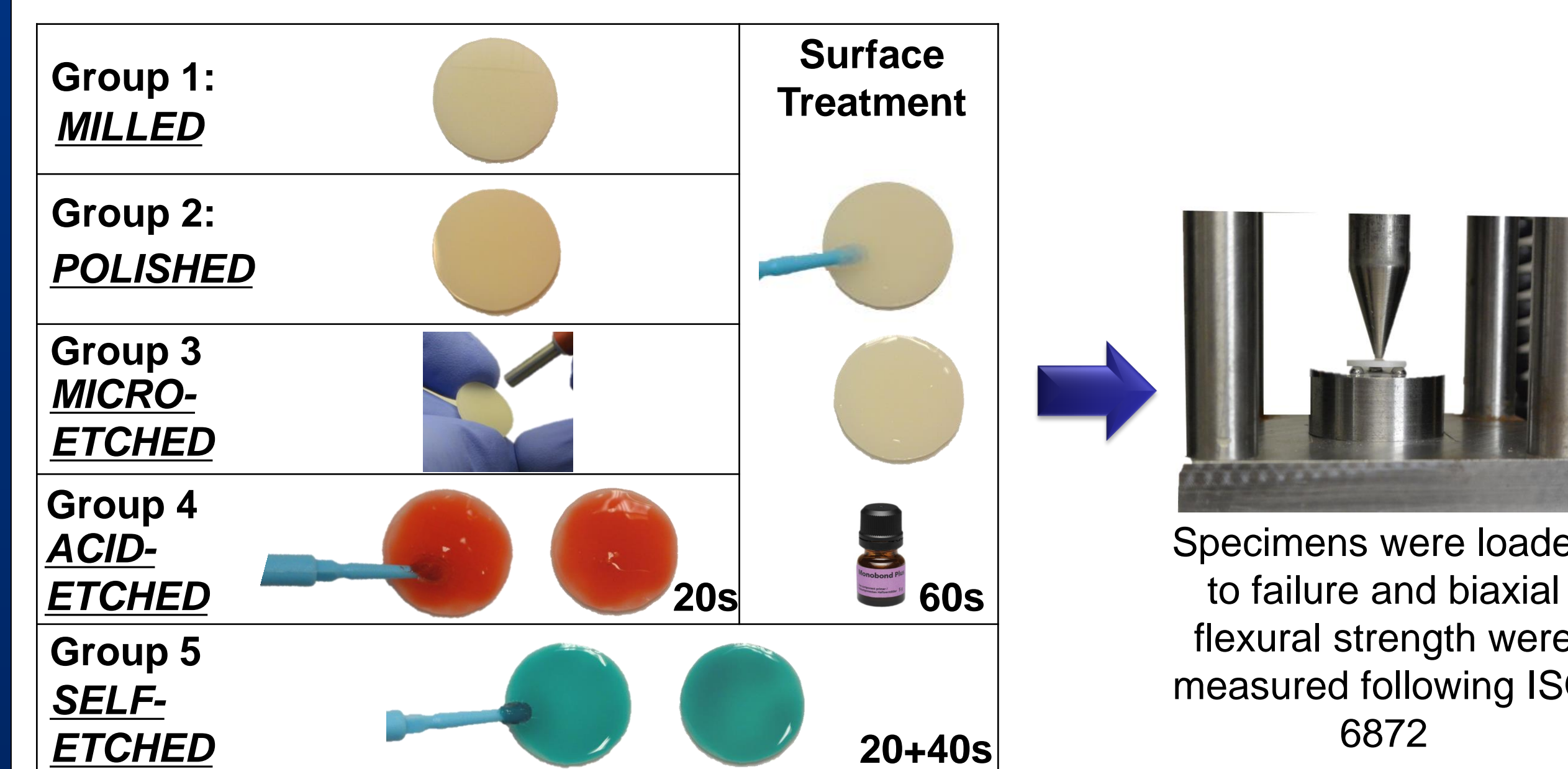
Method:

A) Specimen preparation and crystallization:



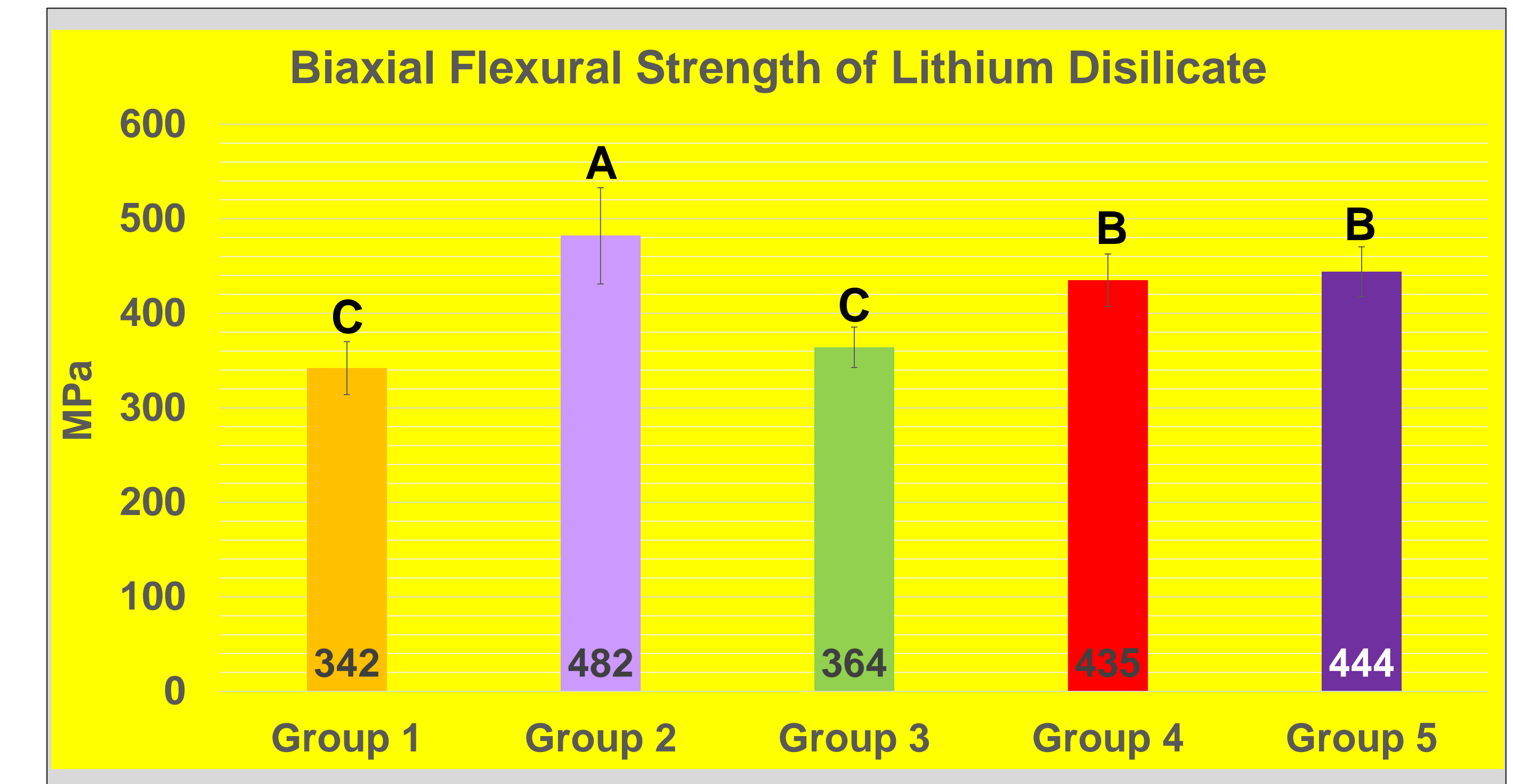
B) Surface preparation and biaxial flexural strength measurement:

Experimental Groups-



RESULTS

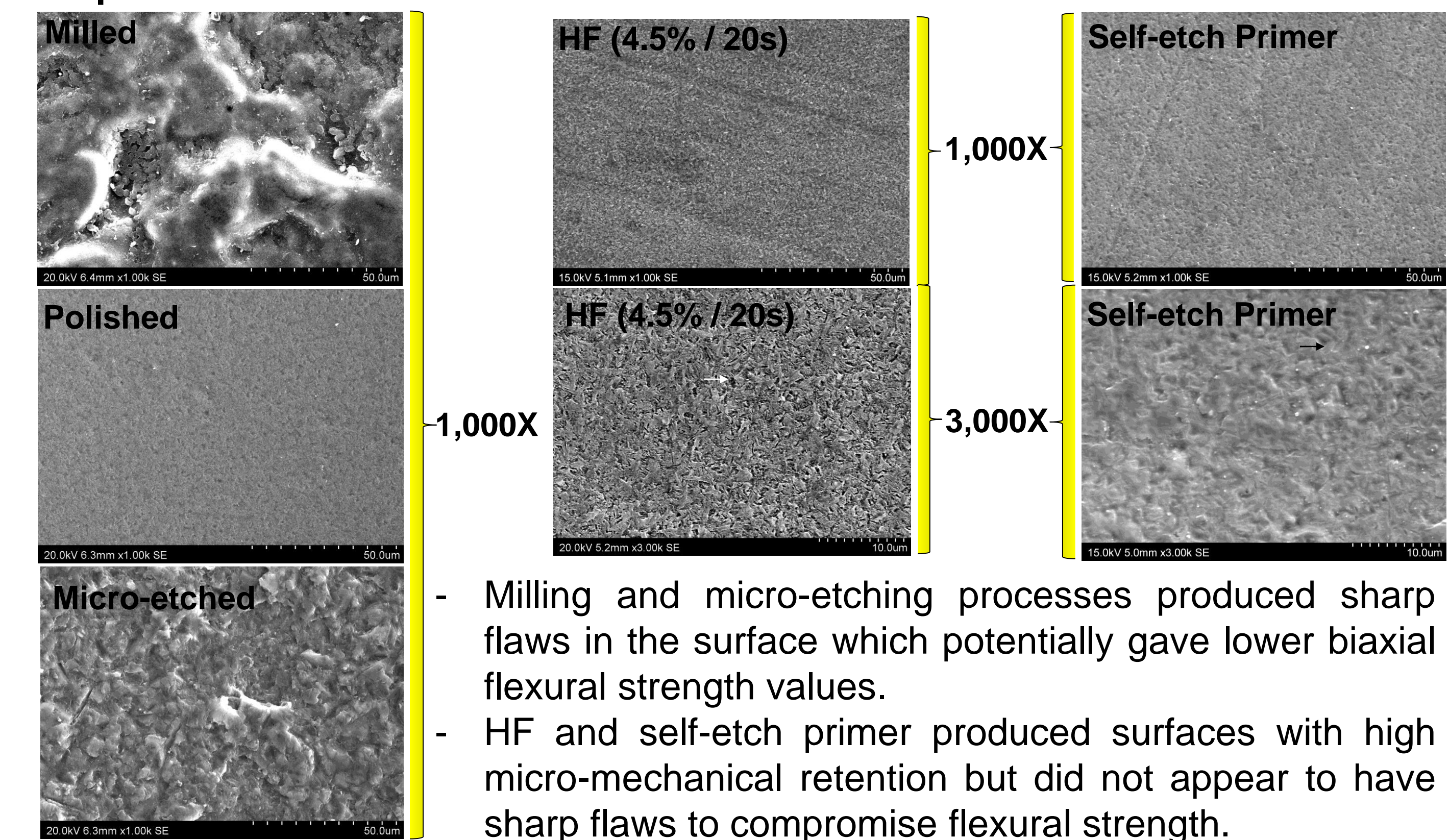
The data was analyzed using One-Way ANOVA and Post hoc Tukey HSD ($\alpha=0.05$) statistical analysis. Null Hypothesis was rejected.



*Groups showing different superscripts were significantly different ($\alpha=0.05$).

DISCUSSION

Representative SEMs:



CONCLUSION

Within the limitation of this study, milled and micro-etched surface finish showed significant decrease in biaxial flexural strength compared to other experimental groups. The polished surface showed the highest strength and no significant difference was observed between acid etch and the new Self-etch primer groups.

REFERENCES

- 1) ISO 6872:2008. Dentistry- Ceramic Materials.
- 2) Monobond Etch and Prime. Scientific Documentation, Ivoclar Vivadent Inc.
- 3) L.A. Zogheib, A. Della Bona, E.T. Kimpara, J.F. McCabe. Effect of hydrofluoric acid etching duration on the roughness and flexural strength of a lithium disilicate-based glass ceramic. *Braz Dent J* (2011) 22 (1):45-50.