

Characterization of glass

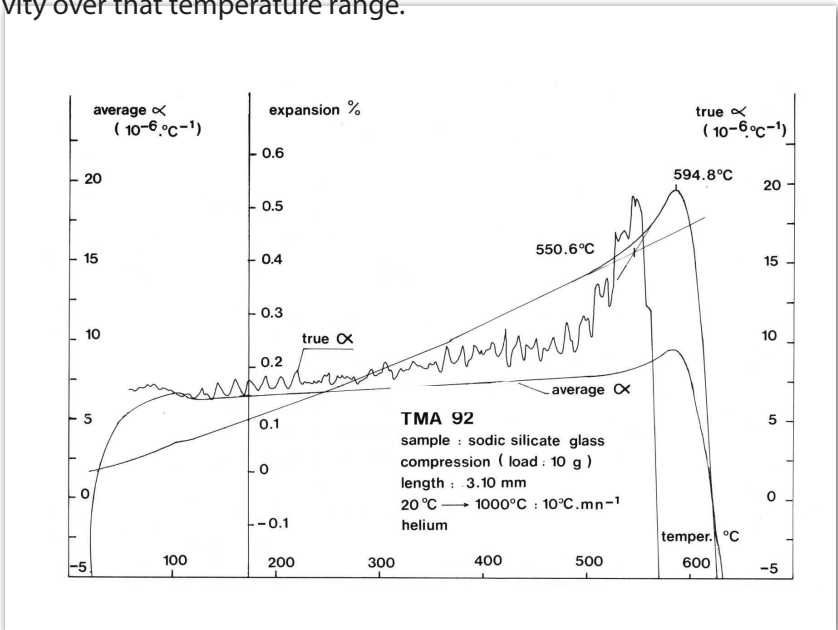
INTRODUCTION

Glasses can be characterized by different parameters such as : the glass transition temperature, the softening point, the true and average coefficients of thermal expansion (alpha). These parameters can be measured by the Thermo Mechanical Analysis (TMA) technique. The THEMYS TMA, allows experiments to be carried out up to 1750°C thanks to its furnace based on a graphite heating element. For experiments between ambient and 1000°C, the TMA module of THEMYS can be equipped with probe made of silica.

It is used to ensure the best accuracy and sensitivity over that temperature range.

EXPERIMENT

Sample : Sodid Silicate glass
 Length : 3.10 mm
 Mode : Compression (load : 10g)
 Probe : Silica
 Atmosphere : Helium
 Procedure: 20 to 1000°C (10 K/min)



RESULTS AND CONCLUSION

By analyzing the changes on the thermal expansion signal, the glass transition temperature and the softening point are found to be 550.6°C and 594.8°C respectively. Between 100 and 500°C the average coefficient of thermal expansion increases from 6.5 up to 8.10⁻⁶ K⁻¹.

INSTRUMENT

THEMYS TMA



- PRESERVATION OF SAMPLES**
due to low load vertical TMA system.
- ULTRA-HIGH TEMPERATURE CAPABILITY**
to 2400°C with a single furnace.
- MODULAR ADAPTIONS ALLOWING**
TGA only, DTA only, TG-DTA, and TMA up to 2400°C, DSC only and TG-DSC up to 1600°C all in one instrument.
- EXTERNAL COUPLING CAPABILITY**
designed for evolved gas analyzers (FTIR, MS, GCMS, MSFTIR, or FTIR-GCMS)