

STUDY OF THE GLASS DEFORMATION REGIME TRANSITION USING INDENTATION AND SCRATCH TEST

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Abstract

The scratch tests are often used to study the friction and the wear phenomena thus to identify locally the materials mechanical proprieties. In this context, our study aims to contribute to the understanding of the glass deformation regime transition using the scratch and the indentation. The characterization of the scratching resistance and the comprehension of the scratching damage on the basic of structural considerations and mechanical analysis were done. Tests of progressive linear scratching and instrumented indentation, were performed on two glasses nuances using different indenters and environments. The obtained results show a similarity of the scratch behavior of the two glass types by comparison of their deformation. However, the obtained rupture critical load of the borosilicate and the soda lime glasses were about 4.16 N and 5.34 N respectively. In addition, the humid environment has a notable effect on the deformation regime in scratching.

Keywords: Glass, Hardness, Indentation, Scratch