

Evaluation of creep rheological parameters: Indentation versus compressive test

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Instrumented indentation test consists in measuring continually the load, induced by an indenter on the surface of the material, in function of the penetration depth. This test has been developed to determine the local mechanical properties and it has been widely used to characterize time-independent materials [1], [2]. Recently, instrumented indentation was interested to time-dependent materials such as polymers [3-5]. In this study, an attempt to investigate the creep during indentation test is done. During the test, the increasing of depth was recorded during a holding period at fixed load (figure 1) in order to determine the creep parameters of two amorphous polymers, Polycarbonate (PC) and Poly(methyl methacrylate) (PMMA). By using the indentation technique, the creep behavior can be evaluated from a low applied load and a micro-residual imprint on a small sample volume. The obtained results are compared with those obtained from creep compressive tests.

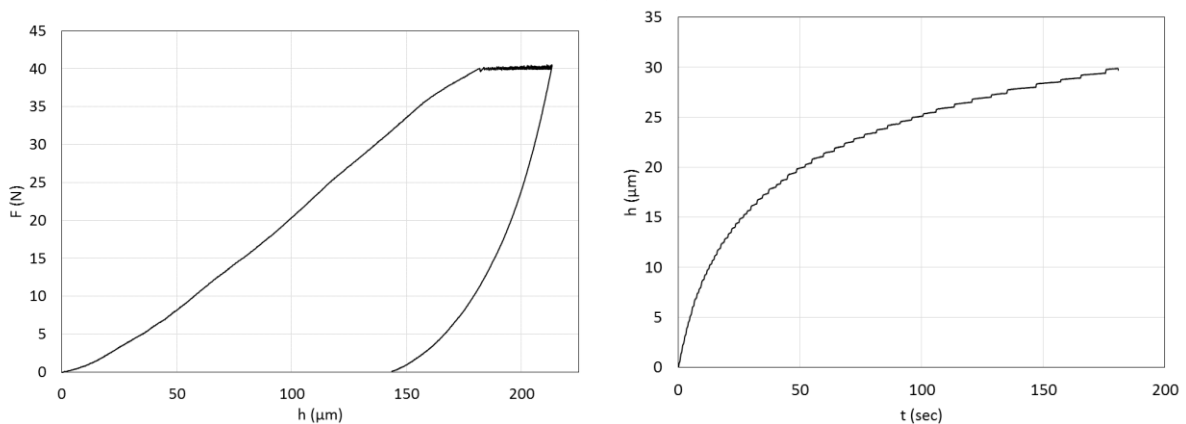


Figure 1: *Experimental spherical (radius of indenter $r = 0.25$ mm) indentation curve on the polycarbonate specimen: (a) load in function of the displacement, (b) displacement in function of the time during holding period.*

References

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