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EXPERIMENTAL INVESTIGATION ON THERMOPLASTIC POLYURETHANE HAVING PARTIAL SHAPE MEMORY EFFECT

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Summary: In the present work, a multi-cycles shape memory tests are performed on thermoplastic polyurethane (TPU) at 70°C which can regain only 67% of its initial shape. This partial shape memory effect (SME) has been improved by successive cycles of shape memory tests. After fourth cycles the polymer is able to regain 100% of its shape. The results of fifth and sixth cycles confirm this modification. These original results indicate that a polymer with partial shape memory effect may be transformed into a shape memory polymer without any chemical modification. This increase of shape memory effect could be related to the creation of residual stresses during the tensile tests. The residual stresses are the origin of the driving force responsible for shape memory effect.