

2013

# Study the influence of temperature on the mechanical behavior of low density polyethylene (LDPE) by genetic algorithms (GA)

**M. Boulkra, A. SOUAHI, W. Ghabeche, H. Serrar, S. BENAYECHE, A. Grid, M. ATHMAINI, S. AMARA, A. BOUAZDIA**

**Abstract :** Mathematical models are more and more used to simulate law mechanical of materials. In this work, genetic algorithm (GA) [1] was performed to determine the law of tensile mechanical behavior of low density polyethylene (LDPE), for a uniaxial tensile test. The parameters taken into account are the constraints based deformation for temperatures as 25 ° C and a strain rate included between  $5 \cdot 10^{-3} \text{ s}^{-1}$  and  $50 \cdot 10^{-3} \text{ s}^{-1}$ . Our simulation results are compared with experimental work. To do this, and to approach the law of the mechanical behavior of the material used in our work, we opted for the method of genetic algorithm, or GA, as a method of simulation, we have applied to LDPE.

**Keywords :** polymer, LDPE, mechanical response, Genetic algorithm, effect of temperature