

Abstract Submitted
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Advances in elastomer reinforcement: slow dynamics PAUL SOTTA, CNRS/Rhodia Research and Technology, France, STÉPHANE DUPRES, PIERRE-ANTOINE ALBOUY, CNRS/university Paris-Sud, Orsay, France, DIDIER LONG, CNRS/Rhodia Research and Technology, France — Elastomers reinforced with nanometric solid particles or aggregates exhibit remarkable properties which are still far to be completely understood: reinforcement, non linear effects, irreversibility. Important progress has been achieved recently in modeling these properties, based on glassy layers around filler particles. In some cases, reinforcement as a function of temperature and filler volume fraction was explained quantitatively. We shall present an ensemble of experimental results obtained in various filled elastomers, which give some new insight on the microscopic mechanisms of reinforcement. We shall focus on two aspects: local strain measured by combining various techniques (NMR, mechanics, onset of strain-induced crystallization), indicate the level of stress heterogeneity in the elastomer matrix in the presence of reinforcing fillers; slow relaxation phenomena which occur in these systems: stress relaxation, memory effects and irreversibility effects -such as plasticity- indicate the importance of glassy regions within the matrix. Refs: J Berriot et al., Europhys. Lett. 2003, 64, 50-56; D. Long and P. Sotta, Macromolecules 2006, 39, 6282.

Paul Sotta
CNRS/Rhodia Research and Technology, France

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