

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Structure and Dynamics of Water Absorbed in Polyamide

MARCO LAURATI, PAUL SOTTA, DIDIER LONG, LUDOVIC ODONI, VERONIQUE BOSSENEC, THIERRY BADEL, Laboratoire Polymeres et Materiaux Avances, UMR5268, CNRS/Rhodia Recherches et Technologies, 85 Rue des freres Perret, 69192 Saint-Fons Cedex, ARANTXA ARBE, ANGEL ALEGRIA, JUAN COLMENERO, Centro de Fisica de Materiales (CSIC-UPV/EHU), Paseo Manuel de Lardizabal 5, 20018 Donostia/San Sebastian, Spain — We present results of elastic and inelastic neutron scattering, dielectric spectroscopy and MD simulations concerning the structural organization and the dynamics of water absorbed in an amorphous polyamide material. We find that, different from predictions of available models of water absorption in polyamide, only a small fraction of water binds to the amide groups while most of it organizes into aggregates. Such structural model is supported by results on the microscopic dynamics of water, which can be described as diffusive motions with a relaxation time following a VFT dependence on temperature, similarly to bulk water. Measured average diffusion coefficients of water absorbed in Polyamide are approximately two orders of magnitude smaller than in bulk water, revealing the confinement effect of the polymer matrix.

Marco Laurati
Laboratoire Polymeres et Materiaux Avances, UMR5268,
CNRS/Rhodia Recherches et Technologies,
85 Rue des freres Perret, 69192 Saint-Fons Cedex

Date submitted: 12 Nov 2010

Electronic form version 1.4