

Abstract Submitted
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Dynamics of phenylene rings in engineering thermoplastics. A quasielastic neutron scattering study ARANTXA ARBE, Unidad de Fisica de Materiales, CSIC-UPV/EHU, SILVIA ARRESE-IGOR, IBAN QUINTANA, ANGEL ALEGRIA, JUAN COLMENERO, Departamento de Fisica de Materiales, University of the Basque Country, BERNHARD FRICK, Institut Laue Langevin — By using quasielastic neutron scattering we have contributed to the long-standing question of the molecular motions behind the secondary relaxations in engineering thermoplastics. The phenylene Hydrogen motions in polyethersulfone and bisphenol-A polysulfone, polycarbonate and phenoxy have been studied by combining time of flight and backscattering techniques in the time range from about 0.1 ps to 1ns. After vibrations and fast processes below 2 ps, the Hydrogen motions reveal relatively fast oscillations and 180° flips of the rings in all cases. Polycarbonate phenylene groups additionally show rotations of about 90°. Relationships among the microscopically observed motions and the secondary relaxations as followed by mechanical and/or dielectric spectroscopy are established.

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