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Why Temperature Variation of the Chain Relaxation is Universal for Many Polymers? ALEXEI SOKOLOV, The University of Akron, UNIVERSITY OF AKRON TEAM — Temperature variations of chain and segmental modes are traditionally described through corresponding friction coefficients. It is usually assumed that the same friction mechanism controls dynamics of both processes. As a result, their temperature dependence is expected to be the same. It is known, however, that segmental relaxation in many polymers varies faster than the chain one when temperature approaches Tg. We present an analysis of temperature variations of segmental and chain modes for different polymers. We demonstrate [1] that the chain relaxation shows universal temperature dependence for many polymers when it is presented vs Tg/T. Even polymers with strongly different temperature behavior of segmental dynamics (fragility) exhibit the same behavior for the chain relaxation. These results indicate complete decoupling in behavior of chain and segmental modes and emphasize our deficiency in understanding the microscopic mechanism of the chain friction coefficient. Possible mechanisms that lead to so universal behavior of chain relaxation are discussed at the end.
[1] Ding, Y., Sokolov, A.P., Macromolecules 2006, 39, 3322.

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