

## Complex dynamics of guest molecules in all-optical poling: kinetic Monte Carlo modelling

We study theoretically the kinetics of non-interacting photo-switchable guest molecules (model azo-dye) dispersed in host (model polymer matrix) in the all-optical poling process close to the glass transition temperature  $T_g$ . The polymer matrix is simulated using the bond-fluctuation model. The kinetics of multiple trans-cis-trans cycles is formulated in terms of transition probabilities which depend on local free volume in the matrix and its dynamics. Close to  $T_g$  complex dynamics of guest molecules is observed, what implies the presence of dynamic heterogeneities of the matrix in space and time which influences guest molecules. A qualitative physical picture of mosaic-like states - intertwined areas of free- and hindered angular motion of guest molecules - is proposed and the role of related short and longer scales in space for the promotion of complex dynamics of guest molecules is discussed.

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