The conformations of cyclic polymers in bidisperse blends of cyclic polymers MICHAEL LANG, Leibniz Institut für Polymerforschung Dresden, Hohe Straße 6, 01069 Dresden, Germany — The size of cyclic polymers in bidisperse blends of chemically identical molecules is analyzed by computer simulations. The compression of entangled rings can be explained by the changes in the penetrable fraction of the surface bounded by the ring. Corrections for small rings can be approximated by a concatenation probability $1 - P_{OO}$ that a cyclic polymer entraps at least one other cyclic polymer. Both results are in line with a previous work [1] on the compression of entangled cyclic polymers in monodisperse melts. For entangled cyclic polymers, bond-bond correlations show a constant anti-correlation peak at a curvilinear distance of about ten segments that coincides with a horizontal tangent in the normalized mean square internal distances along the ring for sufficiently large degrees of polymerization. In consequence, the length scale of topological interactions must be considered as constant in contrast to a recent proposal by Sakaue [2]. Our data is not in accord with an extension of the model of Cates and Deutsch [3] to bidiperse blends of ring polymers.

[1] M. Lang, J. Fischer, J.-U. Sommer, Macromolecules 45 (2012) 7642-7648.
[2] T. Sakaue, Phys. Rev. Lett. 2011, 106, 167802.
[3] M. E. Cates, J. M. Deutsch, J. Phys. (Paris) 1986, 47, 2121 2128.

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