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Influence of entropic configurational effects on the surface tension of symmetric star polymers ZHENYU QIAN, VENKATACHALA MINNIKANTI, LYNDEN ARCHER, BRYAN SAUER, CORNELL UNIVERSITY COLLABORATION, DUPONT COLLABORATION — Surface tension of symmetric 4 and 11 arm polystyrenes have been measured for a series of different molecular weights. We observe that entropic effects contribute significantly to the variation of surface tension as a function of molecular weight. Minnikanti and Archer have developed an expression that relates the surface tension of a symmetric star polymer with its molecular weight. To determine the dependence of surface tension on the reciprocal of molecular weight, the number of arms and dimensionless attraction of the ends and branched point towards the surface play a significant role. We estimated the entropic attraction of the ends and joints from independent self consistent field simulations of a polymer on a lattice. The predicted variations in surface tensions due to entropic reasons were found to constitute a large part of the experimentally observed surface tension variation with molecular weights for 4 and 11 arm stars.

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