

Abstract Submitted  
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**Steric Constraints in Fractal-Regime Star Polymers** GREGORY BEAUCAGE, DURGESH RAI, RAMANTH RAMACHANDRAN, University of Cincinnati, KEDAR RATKANTHAR, NIKOS HADJICHRISTIDIS, University of Athens, HONG KUNLUN, DAVID UHRIG, Oak Ridge National Laboratory — Star polymers at high functionality,  $f$ , and high arm length,  $z_{arm}$ , display a collapsed core structure described by Daoud and Cotton in a colloidal regime (CR). At lower functionality ( $f < \sim 8$ ) and relatively low arm length, stars display a polymeric structure in a fractal regime (FR). For FR stars in good solvents the arms display steric interactions analogous to polymer chains tethered to a surface. We have used small-angle neutron scattering to quantify, for the first time, this steric interaction so as to understand the approach to the CR as a function of  $z_{arm}$  and  $f$  as well as temperature and solvent type. Experimental data from model star polymers and literature data from polyurethane stars are considered as examples.

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