1121-35-119 **Stan Alama*** (alama@mcmaster.ca), Department of Math & Stats, McMaster University, 1280 Main St West, Hamilton, ON L8S 4K1, Canada, **Lia Bronsard** (bronsard@mcmaster.ca), Dept of Math & Stat, McMaster University, 1280 Main St West, Hamilton, ON L8S 4K1, Canada, and **Ihsan A Topaloglu** (itopalog@math.mcmaster.ca), Dept of Math & Stat, McMaster University, 1280 Main St West, Hamilton, ON L8S 4K1, Canada. *Minimizers of an Energy Modeling Nanoparticle-Polymer Blends.*

We identify the Γ-limit of an energy related to nanoparticle/block copolymer models as the number of particles goes to infinity and as the size of the particles and the phase transition thickness of the polymer phases approach zero. The limiting energy consists of two terms: the perimeter of the interface separating the phases and a penalization term related to the density distribution of the infinitely many small nanoparticles; and, can be considered as a toy model where a penalization term affects the phase transition morphology. We prove that local minimizers of the limiting energy admit regular phase boundaries and derive necessary conditions of local minimality via the first and second variations of the limiting energy functional. Finally we discuss possible critical and minimizing patterns in two dimensions and how these patterns vary from global minimizers of the purely local isoperimetric problem. (Received July 14, 2016)