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A path to designing self-assembling surface patterns on particles for self-assembly of the particles themselves[1] OSKAR LINDGREN, ERIK EDLUND, MARTIN NILSSON JACOBI, Chalmers University of Technology — Patchy colloids are promising candidates for self-assembly of metamaterials since directional attraction and high specificity reduces the ambiguity of the low energy state, this simplifies the design of self-assembling building blocks. However, the large scale fabrication of colloids with specific patterns becomes more difficult as the complexity of the surface pattern increases. Self-organiziation of the surface patterns themselves have been suggested as a promising fabrication method due to the new types of patterns it makes accessible. We present a method for designing self-assembling patterns in multiple components system on particle surfaces. The method is based on an analytical treatment of an effective interaction representation of real systems. As an example, we use a simplified model of Alkalethoils-on-gold to show how a limited amount of system parameters can be tuned in order to cause self-assembly of desired surface patterns. We perform in silico self-assembly of surface patterns on spherical colloids, the patterns then causes the colloids themselves to self-assemble into various geometric target structures like strings, membranes, cubic aggregates and lattices.

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