

Abstract Submitted
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Convective self-propulsion of catalytic particles OLEG SHKLYAEV, HENRY SHUM, ANNA BALAZS, Univ of Pittsburgh — A mechanism for the self-propulsion of particles by transduction of chemical energy into convective motion of the host fluid is proposed. The convection is driven by the fluid density variation created around active particles uniformly coated with a catalyst that decomposes a reagent present in the solution. Active particles and passive particles, which are not coated with catalyst, initially dispersed throughout the container are assembled into clusters by the fluid flow. The fluid dynamics are modelled via a lattice-Boltzmann approach and interactions with solid particles through the immersed boundary method. Depending on the configuration and composition of the cluster, the geometry of the container, and the chemical reaction considered, the mobile clusters can translate, spin, or remain stationary.

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