

Abstract Submitted  
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**Passive colloids work together to become Active** HIMA NAGAMANASA KANDULA, Center for Soft and Living Matter, Institute for Basic Science (IBS), WEI WANG, School of Materials Science and Engineering, Harbin Institute of Technology; Center for Soft and Living Matter, IBS, JIE ZHANG, Department of Materials Science and Engineering, University of Illinois, Urbana, Illinois, HUANXIN WU, Department of Physics and Astronomy, Northwestern University, MING HAN, Graduate Program in Applied Physics, Northwestern University, ERIK LUIJTEN, Department of Materials Science and Engineering, Engineering Sciences and Applied Mathematics and Physics and Astronomy, Northwestern University, STEVE GRANICK, Center for Soft and Living Matter, IBS; Department of Chemistry, UNIST — In recent years there is growing body of research to design self-propelled colloids to gain insights into non-equilibrium systems including living matter. While most active colloids developed hitherto entail prefabrication of Janus colloids and possess single fixed active site, we present one simple system where active colloids are formed in-situ naturally with multiple active sites and are reversible as well as reconfigurable. A binary mixture of Brownian colloids which have opposite polarizations when subjected to an AC electric field spontaneously assemble into clusters which are propelled by asymmetric induced charge electro osmosis. We find that tuning the relative sizes of the two species allows for the control over the number of active sites. More interestingly, the patches are dynamic enabling reconfiguration of the active cluster. Consequently, the clusters are active not only in motion but also in their structure.

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